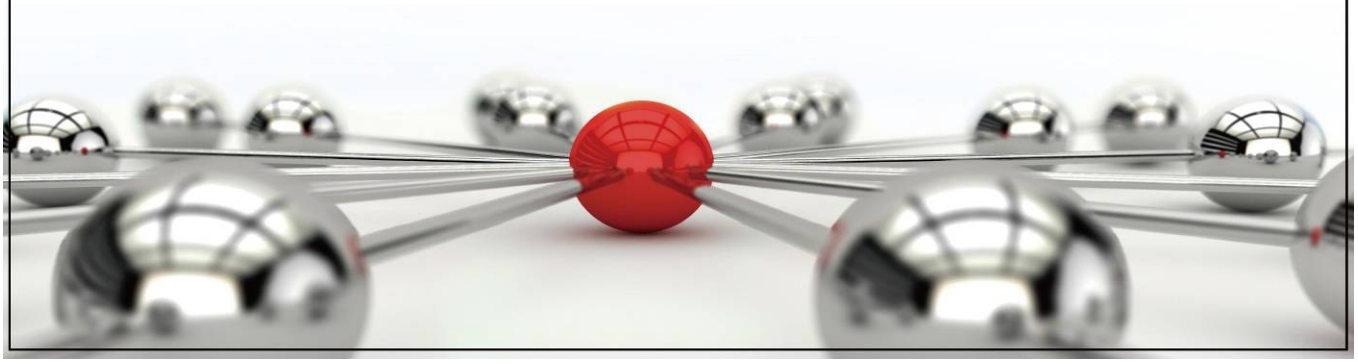
ACE-S7400

User Manual



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Chapter 1 Introduction

ACE-S7400 is an All-in-One gaming control box based on AMD most advanced Fusion platform which integrates AMD Radeon HD 6310 graphic controller. It is designed for slot machine and AWP machine which requires powerful 3D video performance. Besides powerful integrated graphic controller, ACE-S7400 integrates all gaming control features.

1.1 Specifications

Items	**Description**
CPU Thermal Module	Fan with heat sink
CPU Board	ACE-B7400
CPU	AMD FT1 processors Single Core:T52R 1.5GHz (18W) Dual Core:T48N 1.4GHz (18W)
Video	1. Integrated AMD Radeon HD 6310 graphic controller 2. Display 1: Single Link DVI with DVI-D connector 3. Display 2: Single Link DVI + VGA with DVI-I connector
System Memory	1. 2 x DDR3 So-DIMM slots 2. Maximum up to 8 Giga Bytes 3. 1 x 1GB DDR3 SDRAM pre-installed
Storage	1. CF socket x 2 2. Optional 2.5” HDD bay
Extension	Not available
Front Panel	A. DVI-D B. DVI-I connector C. 2x (RJ45 Giga LAN + 2 USB) D. 1 x 2 USB connector E. COM1 to COM 4 (Male DB9) F. Power & HDD LED
Rear Panel	A. 2x 16 pin micro fit connector for digital input B. 2x 20 pin micro fit connector for digital output C. 1x 14 pin micro fit connector for COM

	D. 1x 6 pin for audio E. 1x 8 pin micro fit connector for power input
Internal I/O	1. 2 x USB 2.0 2. On board intrusion switch 3. 1x intrusion input from on board 2-pin JST connector
System fan	2x temperature controllable system fan
Operation temperature	0 to 60 Degrees Celsius
Expansion Module	Not Available
Power requirement	Power supply from external 1. +12V & +24V from 8-pin Micro fit connector

1.2 Packing List

Check if the following items are included in the package.

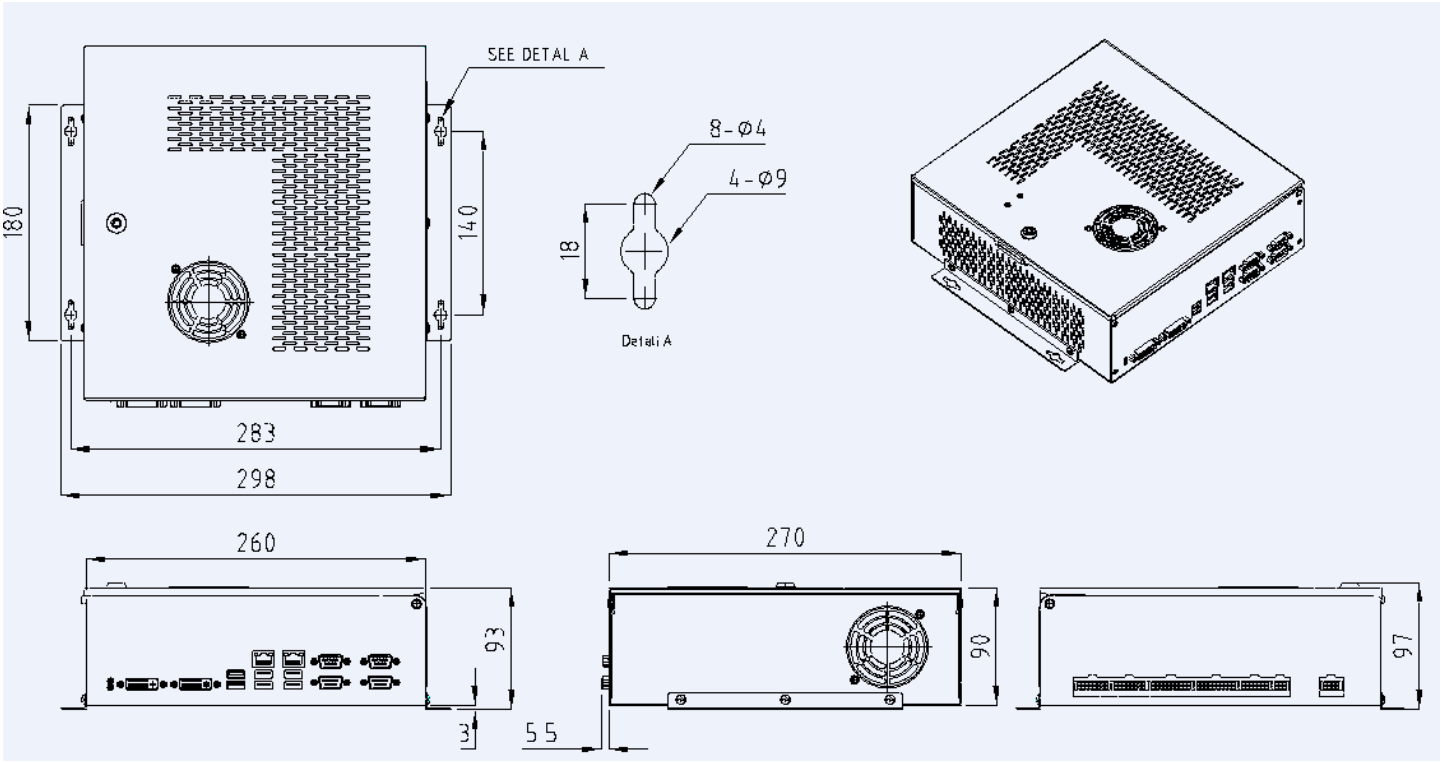
- ACE-S7400 system
- Cable accessory
- Software utility CD
- Mounting brackets

1.3 Features

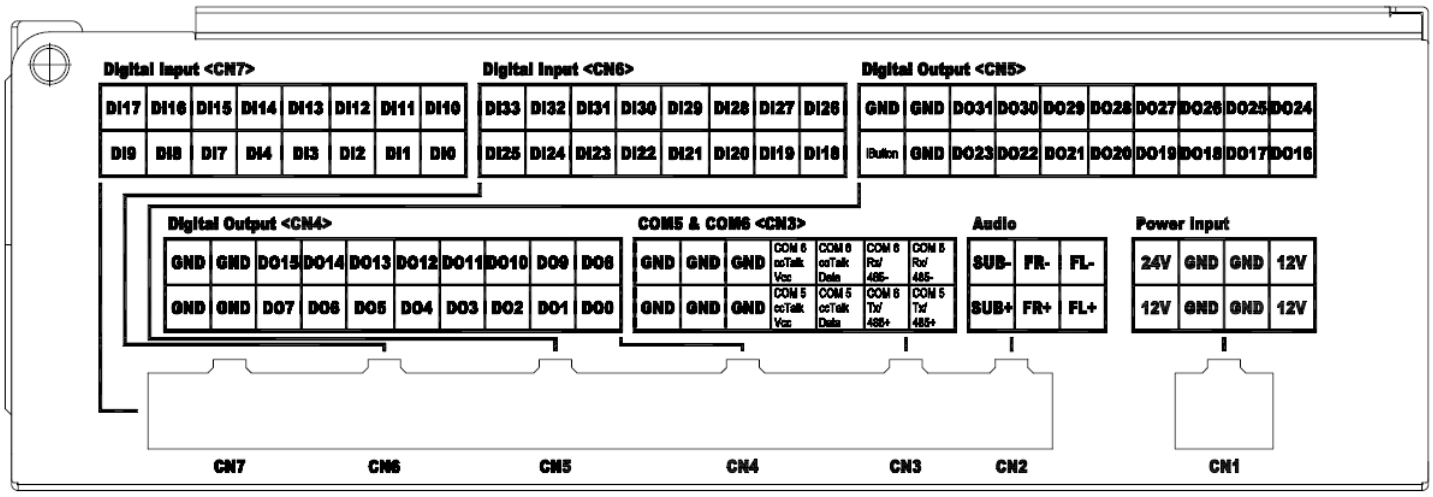
- AMD Fusion Single core (T52R) or Dual cores (T48N) processor
  * Up to 8GB DDR3 memory
- international gaming interface with micro-fit connectors
  * 42 * digital inputs and 32 * high current digital outputs
  * Intrusion logger
  * 6 * serial ports includes 2 * ccTalk ports
- 8 * USB ports to connect different peripherals
  * Dual 1MB battery back-up SRAM with battery low monitoring, max Dual 2MB SRAM
  * 4 x 16-bit timers
- 5.1 CH audio output with amplifier power to meet gaming applications
  * iButton, ProtectU® & EEPROM for software security

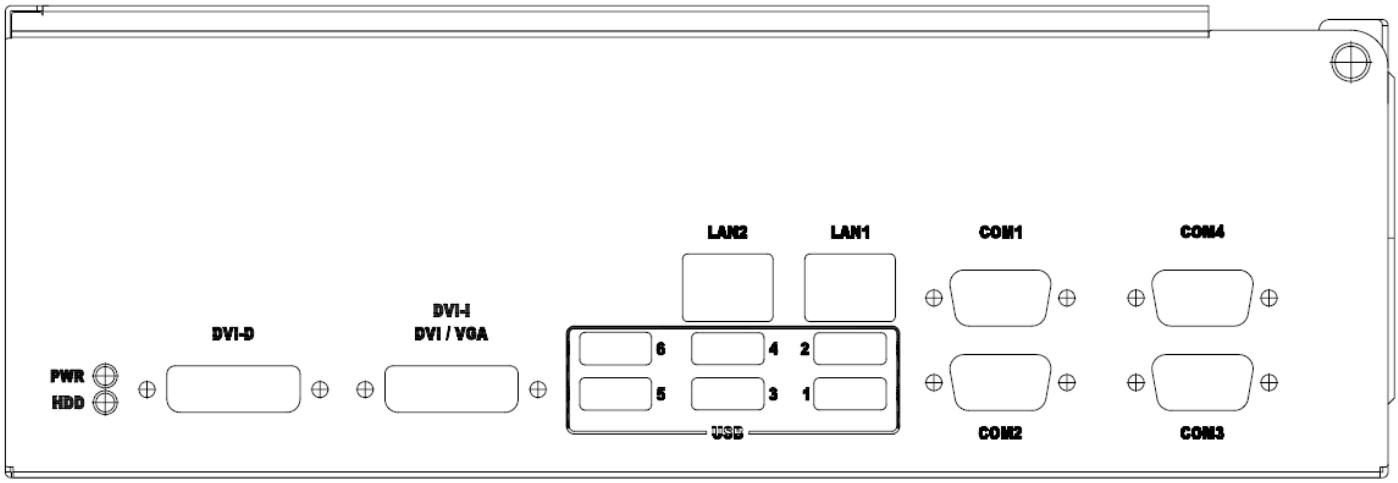
1.4 System Dissection

1.4.1 Dimensions

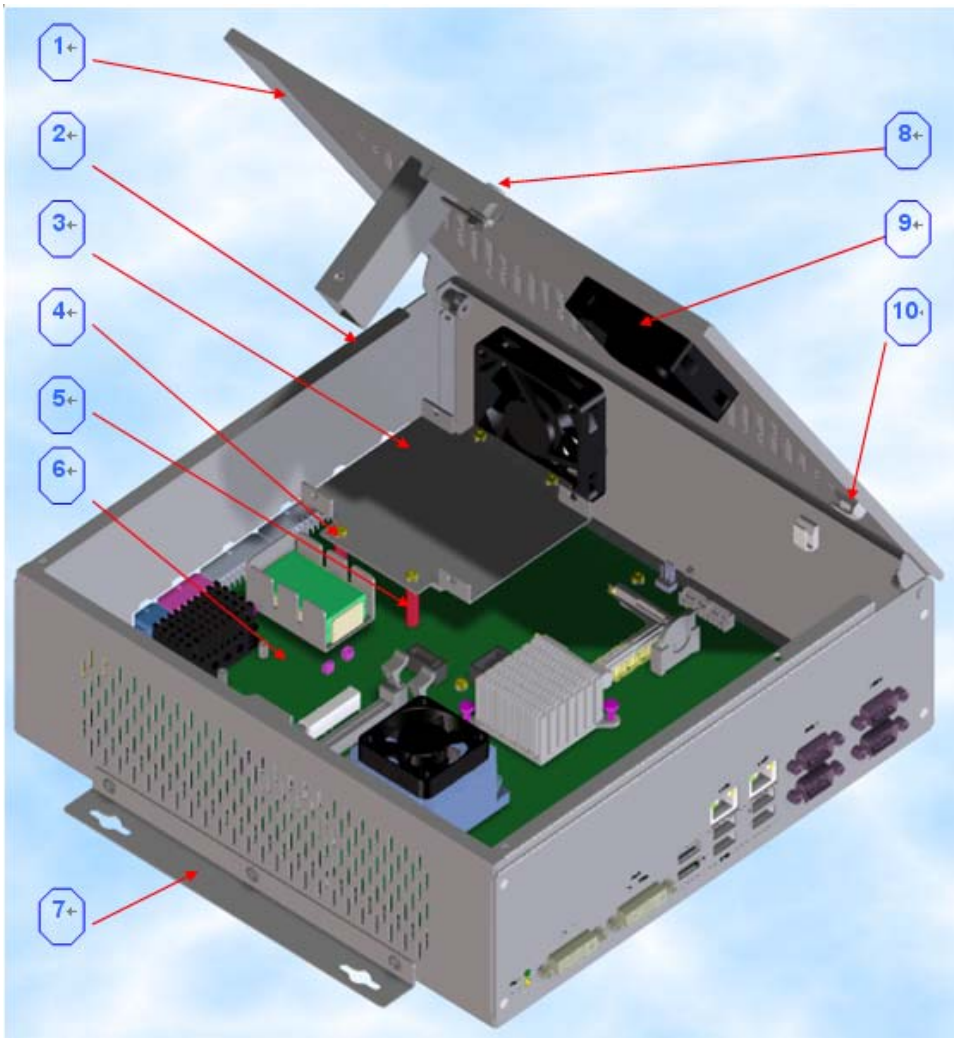


1.4.2 Front Panel


Digital Input <CN7>
DI17 DI16 DI15 DI14 DI13 DI12 DI11 DI10
DI9 DI8 DI7 DI4 DI3 DI2 DI1 DI0
Digital Input <CN6>
DI33 DI32 DI31 DI30 DI29 DI28 DI27 DI26
DI25 DI24 DI23 DI22 DI21 DI20 DI19 DI18
Digital Output <CN5>
GND GND DO31 DO30 DO29 DO28 DO27 DO26 DO25 DO24
iButton GND DO23 DO22 DO21 DO20 DO19 DO18 DO17 DO16
Digital Output <CN4>
GND GND DO15 DO14 DO13 DO12 DO11 DO10 DO9 DO8
GND GND DO7 DO6 DO5 DO4 DO3 DO2 DO1 DO0
COM5 & COM6 <CN3>
GND GND GND COM 6 ccTalk Vcc COM 6 ccTalk Data COM 6 Rx/ 485- COM 6 Rx/ 485-
GND GND GND COM 5 ccTalk Vcc COM 5 ccTalk Data COM 6 Tx/ 485+ COM 5 Tx/ 485+
Audio
SUB- FR- FL-
SUB+ FR+ FL+
Power Input
24V GND GND 12V
12V GND GND 12V
CN7
CN6
CN5
CN4
CN3
CN2
CN1



1.4.3 System Configuration



Item	Description	Quantity
1	TOP COVER	1
2	BASE	1
3	HDD BRACKET	1
4	M3*0.5pitch*8L SPRING SCREW	4
5	HEXAGON SCREW	4
6	ACE-B7400	1
7	MOUNTING BRACKET	2
8	KEY LOCK	1
9	FAN	2
10	WIRE MOUNT	3

Chapter 2 Procedures of Assembly/Disassembly

2.1 SO-DIMM Installation

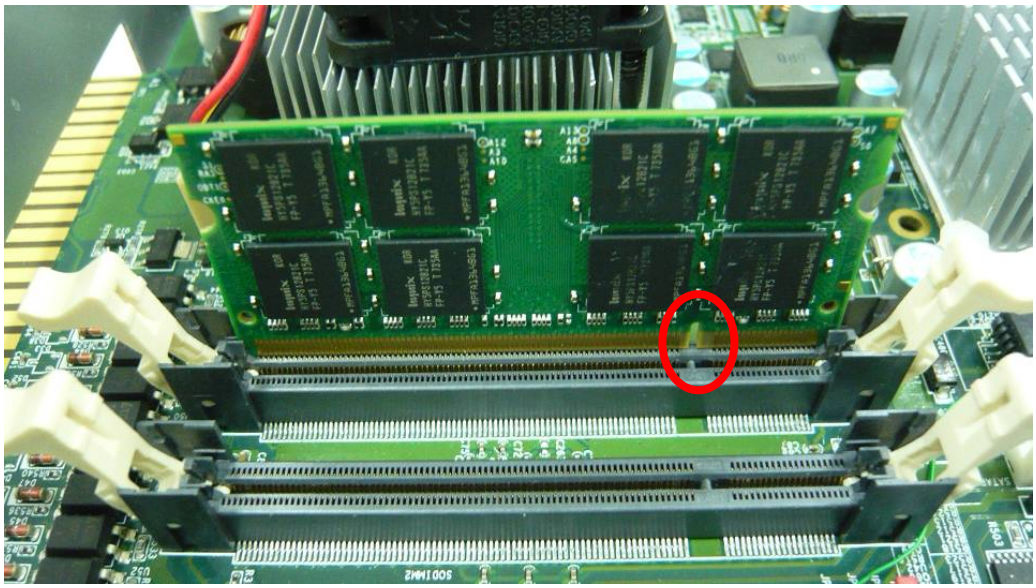
The following instructions will guide you to install SO-DIMM step-by-step.

2.1.1 Unlock key of chassis top cover.

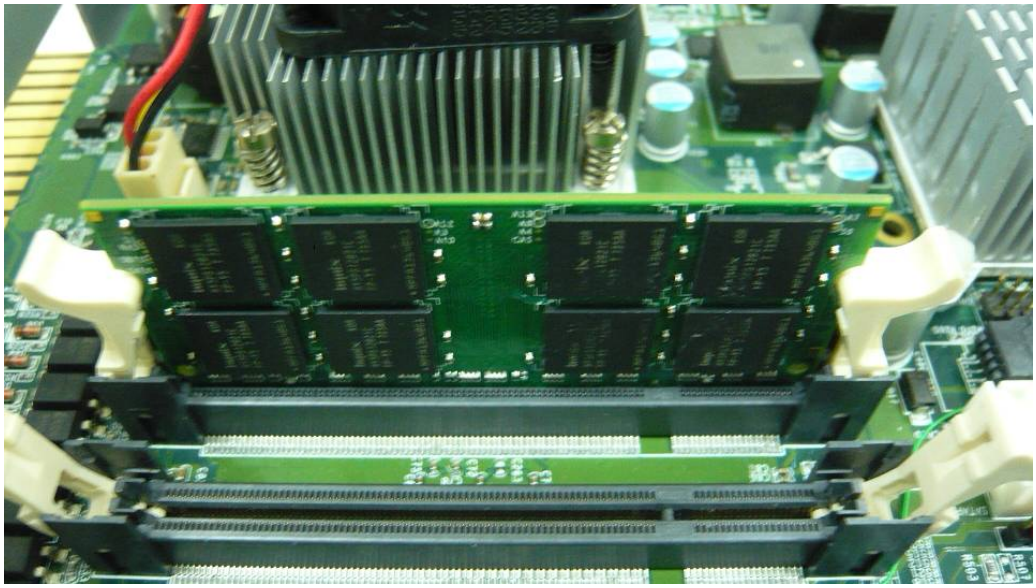
2.1.2 Open top cover.

2.1.3 Install the SO-DIMM memory module into the SO-DIMM socket.

- Align the memory module's cutout with the SO-DIMM slot notch.



- Slide the memory module into the SO-DIMM slot.

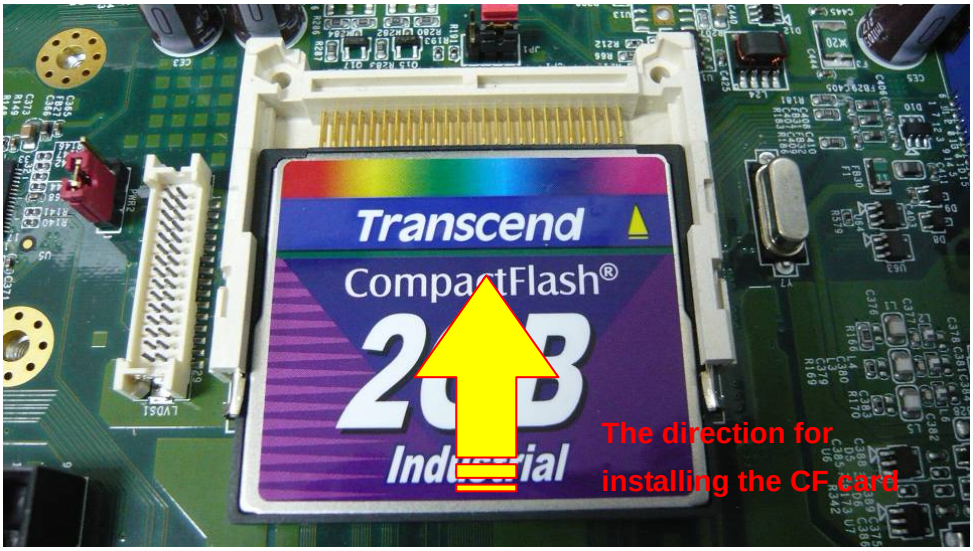


2.1.4 Assemble top cover with key.

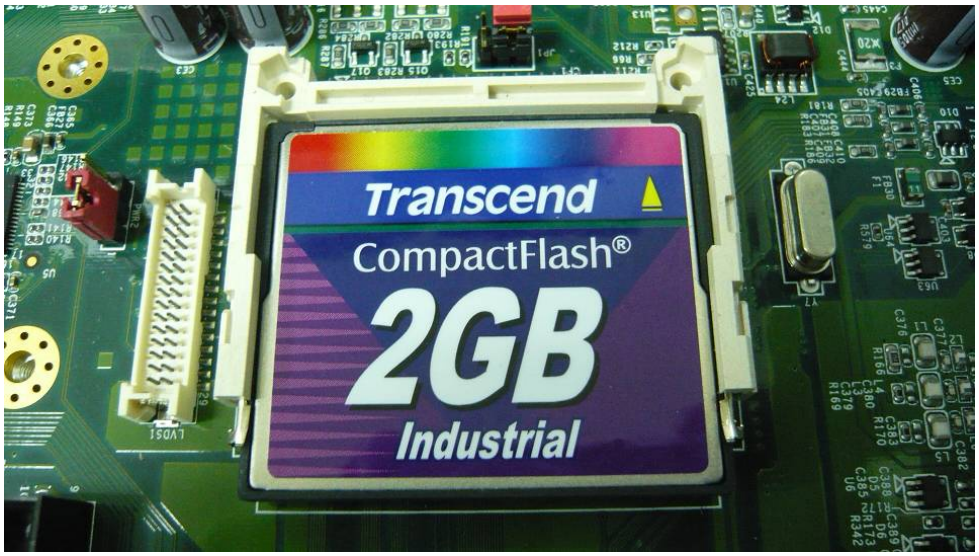
2.2 CF Card Installation

2.2.1 Open the top cover (the same as above steps).

2.2.2 Push the CF card into CF socket.

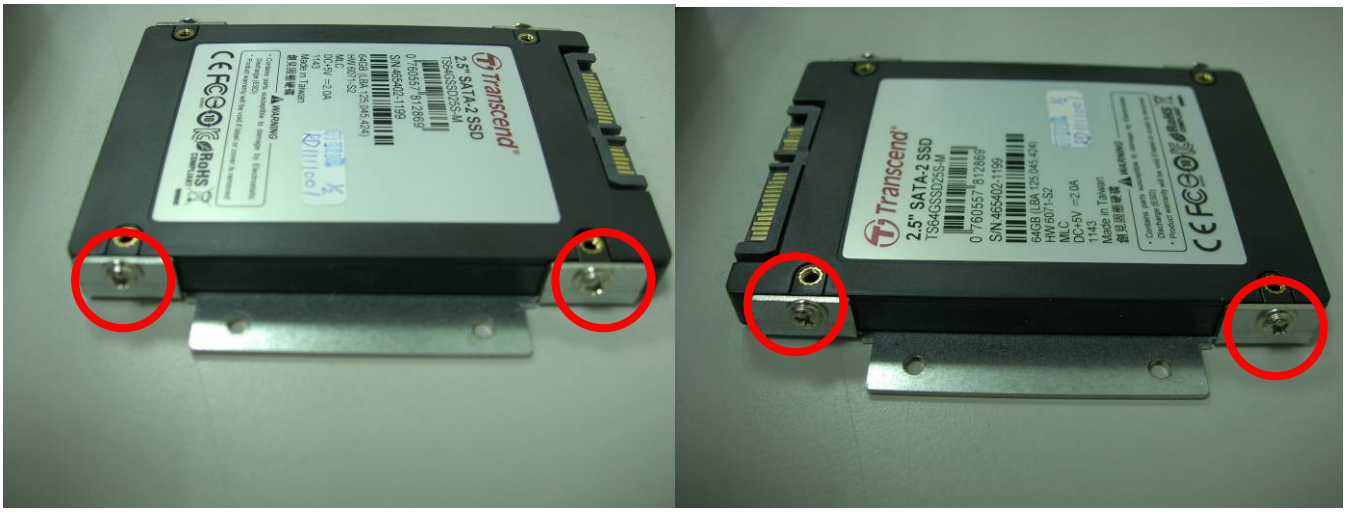


2.2.3 Finish the CF installation.

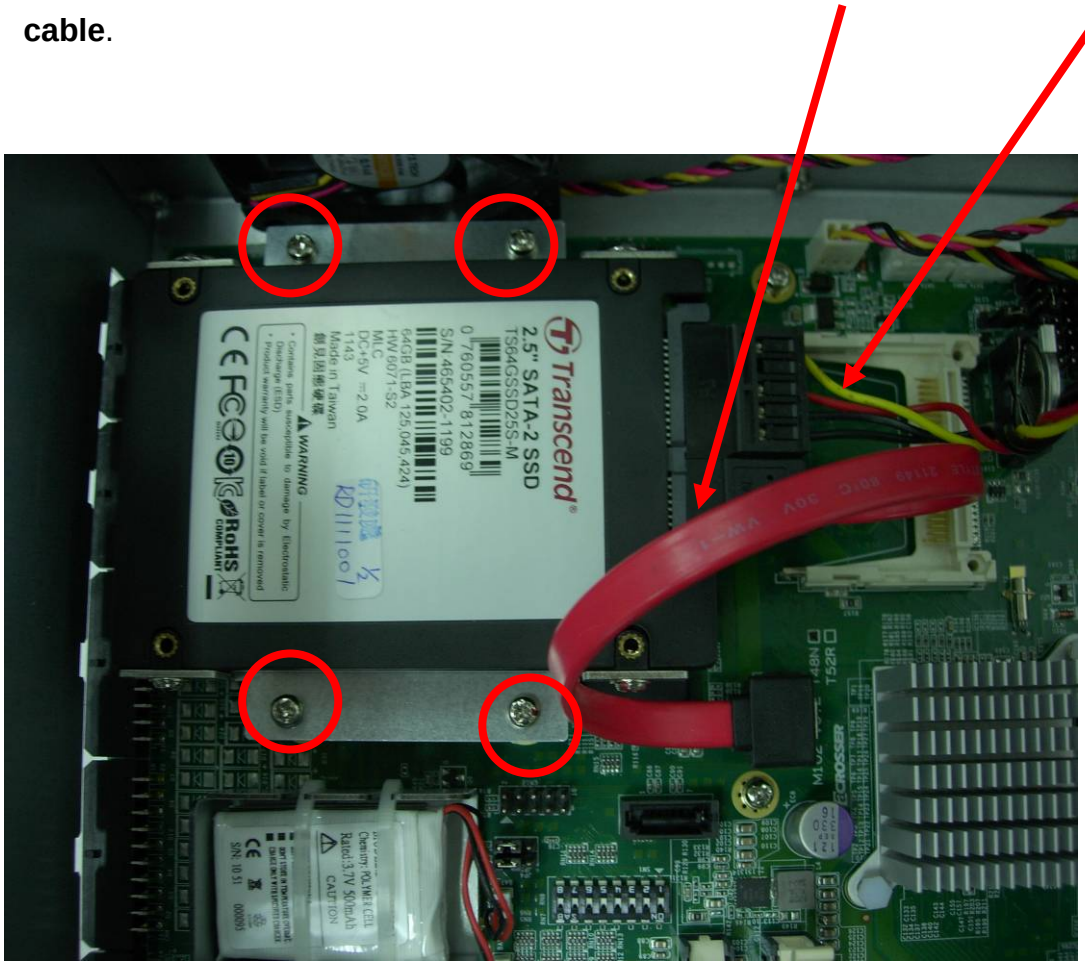


2.3 SATA HDD installation

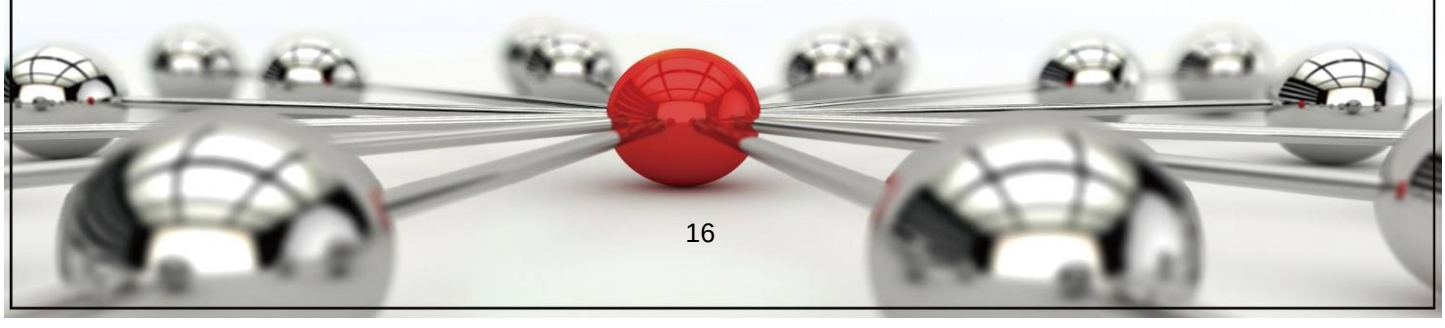
2.3.1 Assemble SATA HDD at HDD braket with four screws.



2.3.2 Assemble to motherboard with four screws. Then install **SATA cable** and **power cable**.



Board Guide



Chapter 1 Introduction

ACE-B7400 is an All-in-One gaming control box based on AMD most advanced Fusion platform which integrates AMD Radeon HD 6310 graphic controller. It is designed for slot machine and AWP machine which requires powerful 3D video performance. Besides powerful integrated graphic controller, ACE-B7400 integrates all gaming control features.

1.1 Specifications

Items	**Description**
CPU Thermal Module	Fan with heat sink
CPU Board	ACE-B7400
CPU	AMD FT1 processors Single Core:T52R 1.5GHz (18W) Dual Core:T48N 1.4GHz (18W)
System Memory	4. 2 x DDR3 So-DIMM slots 5. Maximum up to 8 Giga Bytes 6. 1 x 1GB DDR3 SDRAM pre-installed
Storage	3. CF socket x 2 4. Optional 2.5” HDD bay
Extension	Not available
Front Panel	G. DVI-D H. DVI-I connector I. 2x (RJ45 Giga LAN + 2 USB) J. 1 x 2 USB connector K. COM1 to COM 4 (Male DB9) L. Power & HDD LED
Rear Panel	F. 2x 16 pin micro fit connector for digital input G. 2x 20 pin micro fit connector for digital output H. 1x 14 pin micro fit connector for COM I. 1x 6 pin for audio J. 1x 8 pin micro fit connector for power input
Internal I/O	4. 2 x USB 2.0 5. On board intrusion switch 6. 1x intrusion input from on board 2-pin JST connector
System fan	2x temperature controllable system fan
Operation temperature	0 to 60 Degrees Celsius

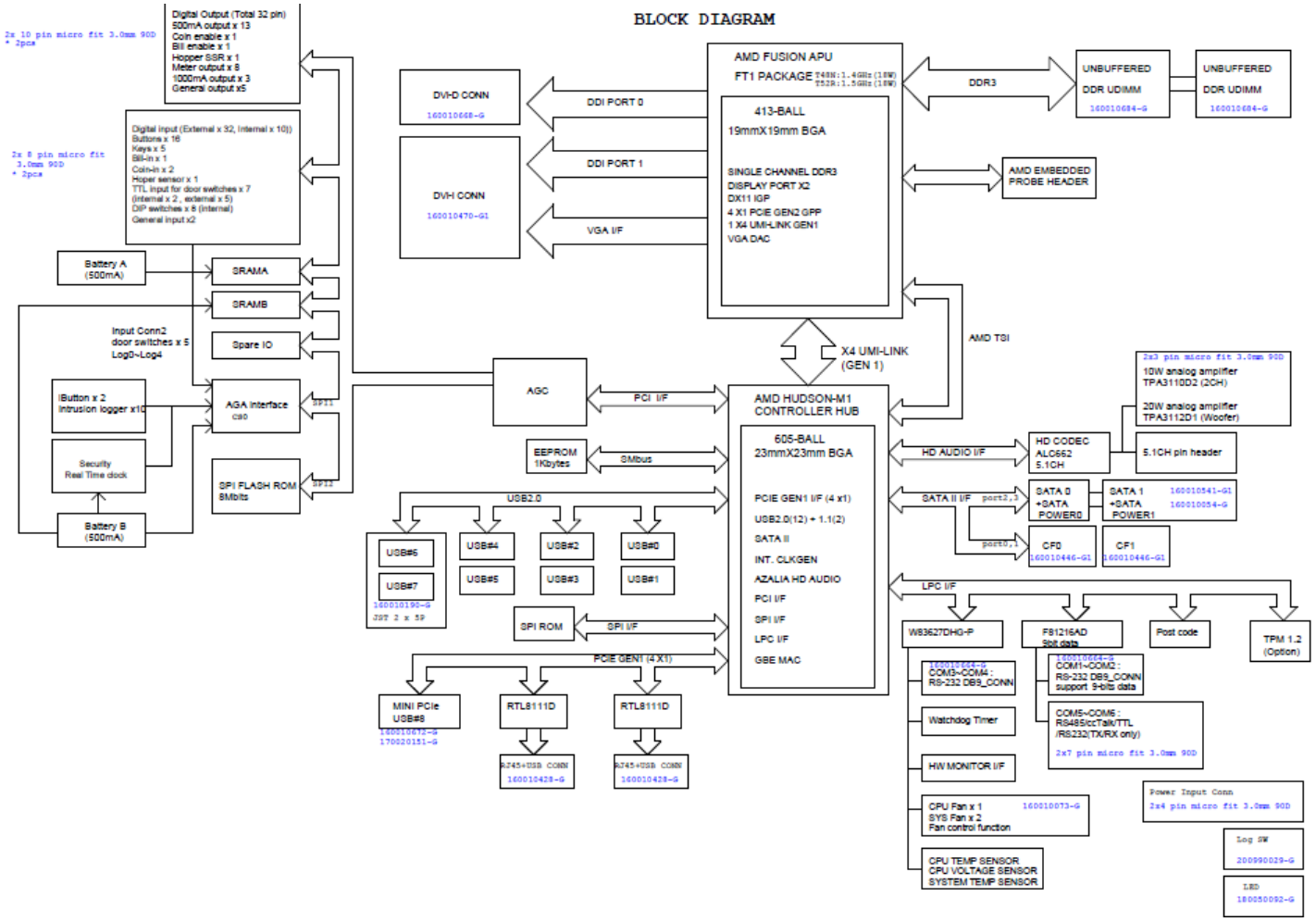
Expansion Module	Not Available
Power requirement	Power supply from external 1. +12V & +24V from 8-pin Micro fit connector

1.2 Package Contents

Check if the following items are included in the package.

- Quick Manual
- AR-B7400 board
- 1 x Software Utility CD

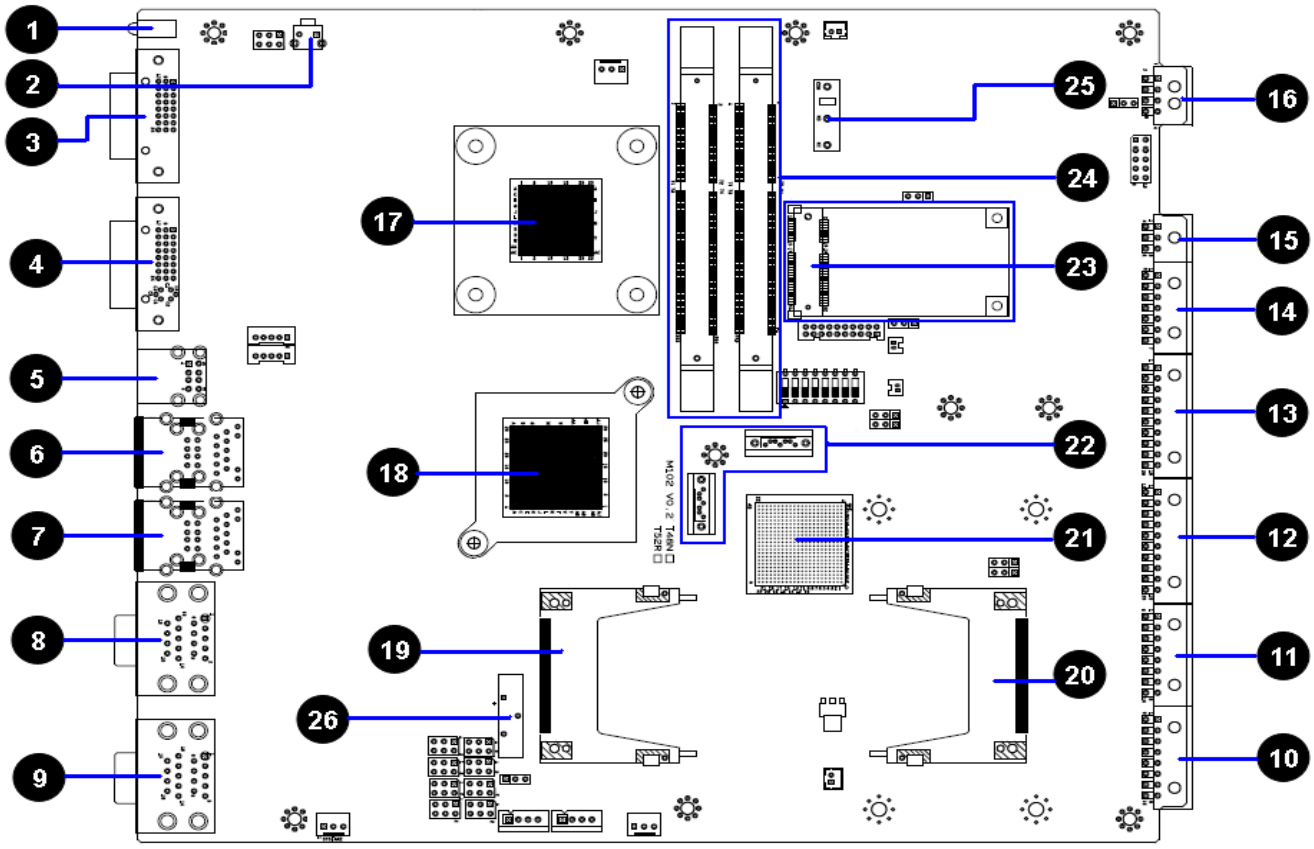
1.3 Block Diagram



Chapter 2 H/W Information

This chapter describes the installation of ACE-B7400. At first, it shows the Function diagram and the layout of ACE-B7400. It then describes the unpacking information which you should read carefully, as well as the jumper/switch settings for the ACE-B7400 configuration.

2.1 Mainboard illustration (Top Side)



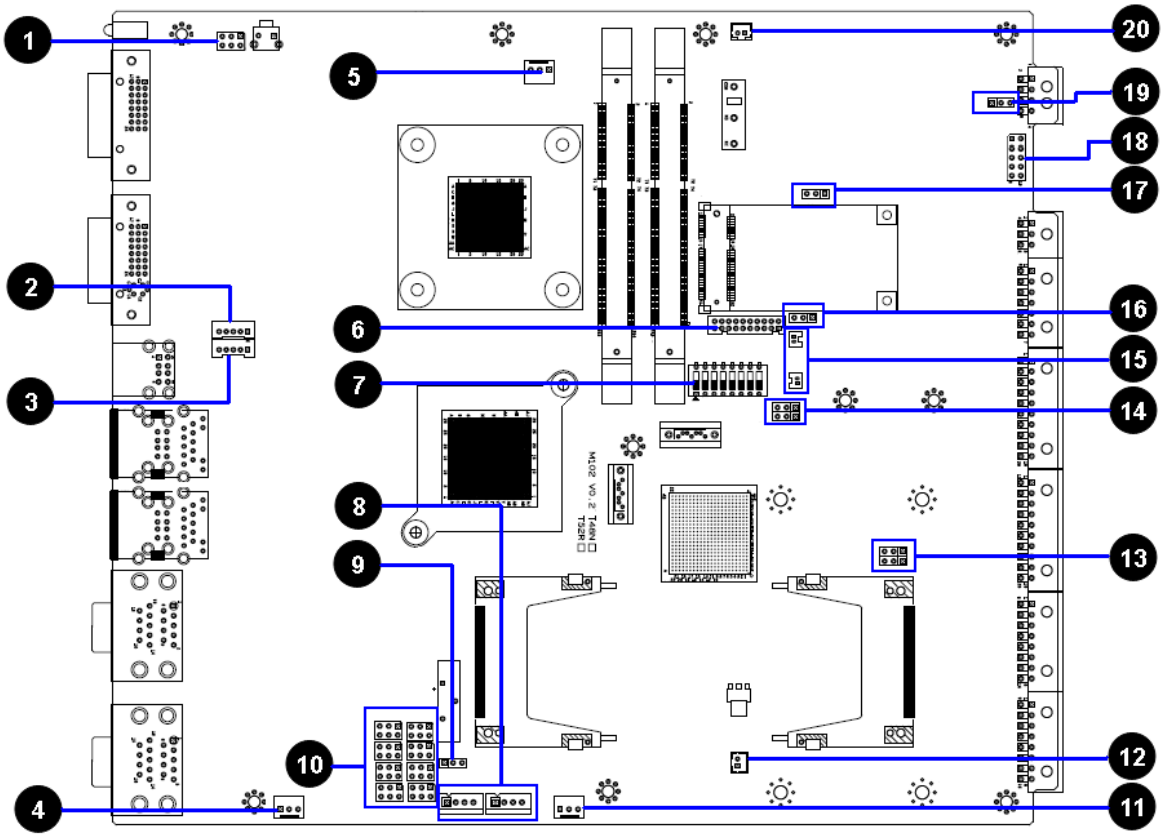
1	**LED1** Green LED: Powered On. Orange LED: HDD Active.	10	**CN7** Gaming Input Isolation Connector. (note2)	19	**CF1** CF Card Slot 1.
2	**PWR_BTN1** System Power Button. (note1)	11	**CN6** Gaming Input Isolation Connector. (note2)	20	**CF2** CF Card Slot 2.
3	**DVI-D1** DVI-D Connector.	12	**CN4** Gaming Open-Drain Output Connector. (note2)	21	**U40** Acrosser Gaming Core.
4	**DVI-I1** DVI-I Connector.	13	**CN4** Gaming Open-Drain Output Connector. (note2)	22	**SATA1/SATA2** SATA 3.0 Connectors.
5	**USB1** Dual-Port USB 2.0 Connector (USB 5, 6).	14	**CN3** Selectable TTL, RS232, RS485, cctalk Connector (UART Port 5, 6).	23	**MINI-PCIE1** Mini-PCIe Slot.
6	**CN25** One RJ45 with Dual USB 2.0 Connector (LAN 2 & USB 3, 4).	15	**CN2** 2.1 Channel Audio Amplifier Output Connector.	24	**CN_DIMM1/CN_DIMM2** DDR3 SODIMM Socket. (note3)
7	**CN26** One RJ45 with Dual USB 2.0 Connector (LAN 1 & USB 1, 2).	16	**CN1** System Power Input Connector.	25	**CASESW1** Micro-switch for Chassis Open/Close Detection.
8	**COM1_2** UART RS-232 Port 1, 2 (Supports 9-bits Protocol).	17	**U43** AMD FT1 APU. (T48N/T52R)	26	**BAT_BH1** System RTC Battery Holder.
9	**COM3_4** UART RS-232 Port 3, 4.	18	**U44** AMD Hudson-E1 Fusion Controller Hub.		

Note1: PWR_BTN can be used as a Power-Button to power-on system when FPIO1/3-4 is not shroted. If FPIO1/3-4 is shroted by a jumper-head, system will automatically boot-up when power applied.

Note2: Please Refer to Page8 for Rears-Panel IO Configurations.

Note3: AMD eOntario Platform supports maximum totle 8GB DDRIII Memory.

2.2 Locations of IO ports & Jumper Setting Definition (Top Side)



1	**FPIO1** System Power Button Pin-header & Reset Jumper.	8	**SATA_PWR1/SATA_PWR2** Two JST 2.5mm SATA Power Connectors.	15	**BAT_A1, BAT_B1** Lithium Battery Connector for SRAM, AGA and secured RTC.
2	**CN_USB1** JST 2.0mm USB Connector (USB7).	9	**CN19** Clear System CMOS Jumper.	16	**JP18** RS-485 Terminal Resistor Selection Jumper for UART 6.
3	**CN_USB2** JST 2.0mm USB Connector (USB8).	10	**JP6 ~ JP13** CN3 Output Signal Selection Jumper.	17	**JP17** RS-485 Terminal Resistor Selection Jumper for UART 5.
4	**SYSFAN2** System FAN Connector 2.	11	**SYSFAN1** System FAN Connector 1.	18	**AUDIO1** Internal 5.1 Channel Audio Pin-Header.
5	**APUFAN1** APU FAN Connector.	12	**IButtom2** JST 2.0mm External i-Button Connector.	19	**JP1** cctalk Supply Power Selection Jumper.
6	**SPAREIO1** JST 2.0mm Gaming Spare-IO Connector. (16-bits GPIO)	13	**JP2/JP3** SRAM A, B Clear Jumper.	20	**CASESW2** JST 2.0mm Chassis Open/Close Detection Connector.
7	**SW1** 8-bit DIP-Switch Input for AGC.	14	**JP4/JP5** Bill-enable, Coin-enable Preset Jumper.		

Connectors and Jumpers Setting

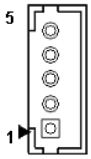
2.1.1 FPIO1

System Power button & Reset Jumper.

JUMPER	FUNCTION
1-2	External Power Button Connection
3-4	Short to Enable Auto Power-on Function.
5-6	System Reset Button Connector

2.1.2 CN_USB1

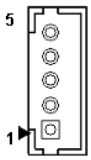
JST 2.0mm USB Connector (USB7).



PIN	SIGNAL
1	VCC (+5V)
2	Data+
3	Data-
4	GND
5	N.C

2.1.3 CN_USB1

JST 2.0mm USB Connector (USB7).



PIN	SIGNAL
1	VCC (+5V)
2	Data+
3	Data-
4	GND
5	N.C

2.1.4 SYSFAN2

System FAN Connector 2.

PIN	SIGNAL
1	GND
2	+12V
3	Feedback

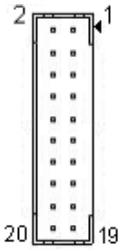
2.1.5 APUFAN1

APU FAN Connector.

PIN	SIGNAL
1	GND
2	+12V
3	Feedback

2.1.6 SPAREIO!

JST 2.0mm Gaming Spare-IO Connector.



PIN	SIGNAL	PIN	SIGNAL
1	Bit0	2	Bit8
3	Bit1	4	Bit9
5	Bit2	6	Bit10
7	Bit3	8	Bit11
9	Bit4	10	Bit12
11	Bit5	12	Bit13
13	Bit6	14	Bit14
15	Bit7	16	Bit15
17	GND	18	+3.3V
19	GND	20	+3.3V

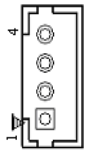
2.1.7 SW1

8-bits DIP-Switch Input for AGC.

PIN	SIGNAL
ON	+3.3V
OFF	GND

2.1.8 SATA_PWR1/ SATA_PWR2

Two JST 2.5mm SATA Power Connectors**.**



PIN	SIGNAL
1	+12V
2	GND
3	+3.3V
4	+5V

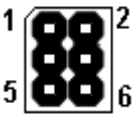
2.1.9 CN19

Clear System CMOS Jumper.

JUMPER	FUNCTION
1-2 (default)	Normal
2-3	Clear CMOS

2.1.10 JP6 ~ JP13

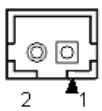
CN3 Output Signal TTL/RS232/RS485/cctalk Selection Jumper.



Please See Appendix A.

2.1.12 IBUTTON2

JST 2.0mm External i-Button Connector.



PIN	SIGNAL
1	I-Button Signal
2	GND

2.1.13 JP2/JP3

SRAM A, B Clear Jumper.

JUMPER	FUNCTION
1-2 (default)	Normal
2-3	Clear SRAM

2.1.14 JP4/JP5

Bill-enable, Coin-enable Preset Jumper.

JUMPER	FUNCTION
1-2 (default)	Preset is “High”.
2-3	Preset is “Low”.

- “High” means Bill-enable, Coin-enable open-drain output is short to ground.
- “Low” means Bill-enable, Coin-enable open-drain output is open

2.1.15 BAT_A1/BAT_B1

Lithium Battery Connector for SRAM, AGA and secured RTC.

PIN	SIGNAL
1	POWER
2	GND

2.1.16 JP18

RS-485 Terminal Resistor Selection Jumper for UART6.

JUMPER	FUNCTION
1-2 (default)	Termination
2-3	Non

RS-485 terminal resistor is 120ohm.

2.1.17 JP17

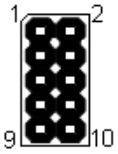
RS-485 Terminal Resistor Selection Jumper for UART5.

JUMPER	FUNCTION
1-2 (default)	Termination
2-3	Non

RS-485 terminal resistor is 120ohm.

2.1.18 AUDIO1

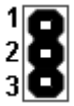
Internal 5.1Channel Audio Pin-Header.



PIN	SIGNAL	PIN	SIGNAL
1	Front-L	**2**	Front-R
3	GND	**4**	GND
5	Surround-L	**6**	Surround-R
7	IO4 GND	**8**	GND
9	Center	**10**	LFE

2.1.19 JP1

ccTalk Supply Power Selection Jumper.

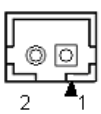


JUMPER	FUNCTION
1-2 (default)	+12V
2-3	+24V

+24Vpower is from CN1 external power supply.

2.1.20 CASESW2

JST 2.0mm Chassis Open/Close Detection Connector.



PIN	SIGNAL
1	Signal
2	GND

Rears-Panel IO Configurations

■ CN1 System Power Input Connector (Micro-FIT 3.0mm 2*4 PINs)

PIN	SIGNAL	PIN	SIGNAL
1	+12V Input	**5**	+12V Input
2	GND	**6**	GND
3	GND	**7**	GND
4	+12V Input	**8**	+24V Input

Note:

1. +12V Power Input voltage tolerance is ±10%.
2. +24V Power Input is only use for cctalk Vs power supply.

■ CN2 2.1 Channel Audio Amplifier Output Connector (Micro-FIT 3.0mm 2*3 PINs)

PIN	SIGNAL	PIN	SIGNAL
1	Amplified Front Left +	**4**	Amplified Front Left -
2	Amplified Front Right +	**5**	Amplified Front Right -
3	Amplified LFE +	**6**	Amplified LFE -

Note:

1. ACE-B7400 with Audio Amplifier is D-type amp.
2. Amplified Right and Left channel support 10Watt $_{(max)}$ Output, Amplified LFE channel supports 20Watt $_{(max)}$ Output.

■ CN3 Selectable TTL, RS232, RS485, cctalk Connector (Micro-FIT 3.0mm 2*7 PINs)

Pin	Signal	Signal	Pin
1	COM5 TTL/ 232 Tx/ 485 +	COM5 TTL/ 232 Rx/ 485 -	**8**
2	COM6 TTL/ 232 Tx/ 485 +	COM6 TTL/ 232 Rx/ 485 -	**9**
3	COM5 ccTalk Data	COM6 ccTalk Data	**10**
4	COM5 ccTalk Vcc	COM6 ccTalk Vcc	**11**
5	GND	GND	**12**
6	GND	GND	**13**
7	GND	GND	**14**

■ CN4/CN5 Gaming IO Output Connector (Micro-FIT 3.0mm 2*10 PINs)

CN4:

Pin	Signal	Pin	Signal
1	LAMP 1	**11**	LAMP 9
2	LAMP 2	**12**	LAMP 10
3	LAMP 3	**13**	LAMP 11
4	LAMP 4	**14**	LAMP 12
5	LAMP 5	**15**	LAMP 12
6	LAMP 6	**16**	Tower LAMP 1
7	LAMP 7	**17**	Tower LAMP 2
8	LAMP 8	**18**	Tower LAMP 3
9	GND	**19**	GND
10	GND	**20**	GND

CN5:

Pin	Signal	Pin	Signal
1	Key-in Meter	**11**	Coin-Enable
2	Bill-in Meter	**12**	Bill-Enable
3	Coin-in Meter	**13**	Hopper-SSR
4	Pay-out Meter	**14**	GP0
5	Key-out Meter	**15**	GP1
6	Hand-pay Meter 1	**16**	GP2
7	Hand-pay Meter 2	**17**	GP3
8	Spare Meter	**18**	GP4
9	GND	**19**	GND
10	GND	**20**	GND

Note:

1. Each LAMP output supports open-drain 500mA $_{(max)}$ current; each Tower LAMP output supports open-drain 1A $_{(max)}$ current.
2. Eight Meters support pulse-Generator function.
3. All output pin is open-drain circuit and operation maximum voltage cannot over +30V.

■ CN6/CN7 Gaming IO Input Connector (Micro-FIT 3.0mm 2*8 PINs)

CN6

Pin	Signal	Pin	Signal
1	Button 12	**9**	Touch-Cal Key-Lock
2	Button 13	**10**	Spare Key-Lock
3	Button 14	**11**	Coin-In Signal A
4	Button 15	**12**	Coin-In Signal B
5	Button 16	**13**	Bill-In
6	Dissolve Key-Lock	**14**	Hopper Sensor
7	OM Key-Lock	**15**	GP0
8	Setup Key-Lock	**16**	GP1

CN7

Pin	Signal	Pin	Signal
1	Door Switch 1	**9**	Button 4
2	Door Switch 2	**10**	Button 5
3	Door Switch 3	**11**	Button 6
4	Door Switch 4	**12**	Button 7
5	Door Switch 5	**13**	Button 8
6	Button 1	**14**	Button 9
7	Button 2	**15**	Button 10
8	Button 3	**16**	Button 11

Note:

1. All input pin logical high-level is +5V ~ +24V, logical low-level is 0V ~ +1.5V.
2. Coin-In Signal A, Coin-In Signal B, Bill-In, and Hopper Sensor support input counter fuction.

Option	Choice	Description
IDE HDD Auto-Detection	Enter	To auto-detect the HDD's size, head…. On this channel
IDE Channel 0 Master	None Auto Manual	Auto Allows BIOS to automatically detect IDE/SATA devices during POST None Select this if no IDE/SATA devices are used and the system will skip the automatic detection step and allow for faster system start up. Manual User can manually input the correct settings.
Access Mode	CHS LBA Large Auto	Use this to set the access mode for the hard drive. The four options are: CHS/LBA/Large/Auto
Capacity	N/A	Capacity of currectly installed hard drive.
Cylinder	N/A	Number of cylinders
Head	N/A.	Number of heads
Precomp	N/A.	Write precomp
Landing Zone	N/A	Landing zone
Sector	N/A	Number of sectors

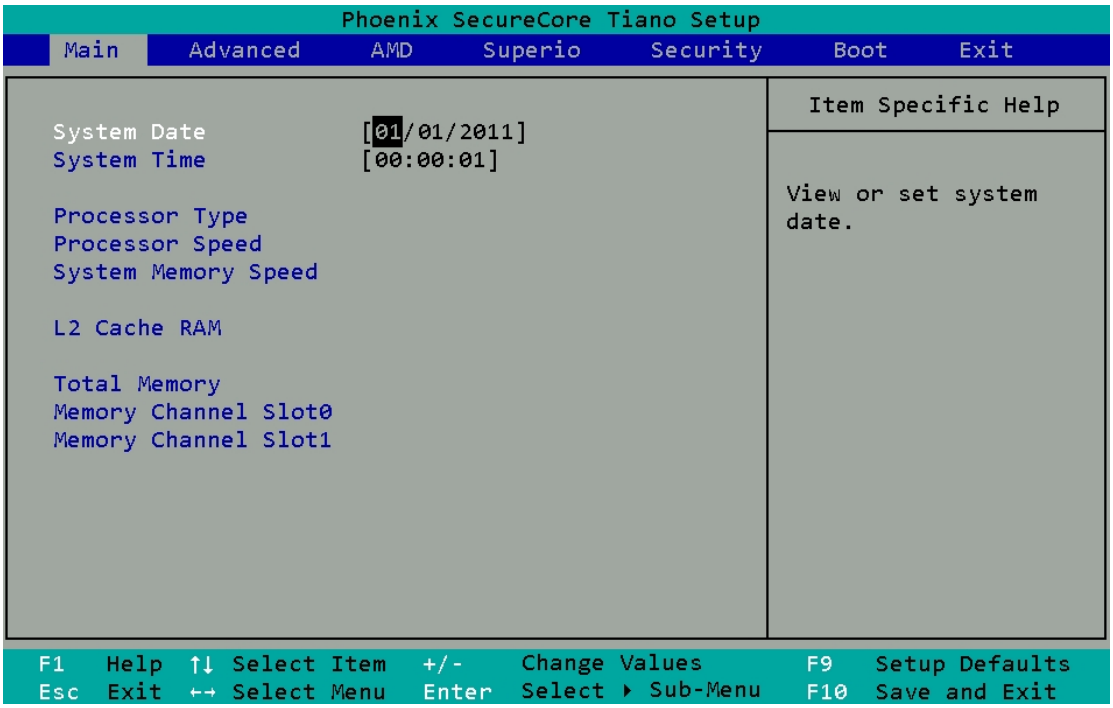
Chapter 3 BIOS Settings

This chapter describes the BIOS menu displays and explains how to perform common tasks needed to get the system up and running. It also gives detailed explanation of the elements found in each of the BIOS menus. The following topics are covered:

- Main Setup
- Advanced Chipset Setup
- AMD Setup
- SuperIO Setup
- Security Setup
- Boot Setup
- Exit Setup

3.1 Main Setup

Once you enter the Phoenix BIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to highlight the item and then use the <Pg Up> <Pg Dn> keys to select the value you want in each item.

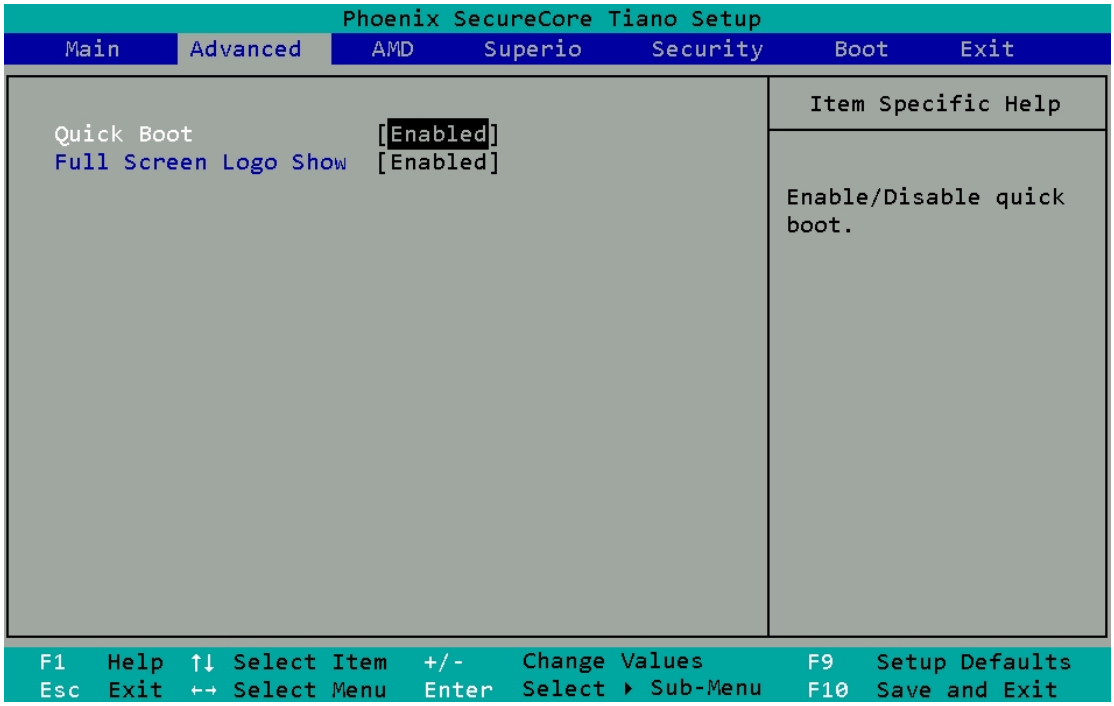


Note: Listed at the bottom of the menu are the control keys. If you need any help with the item fields, you can press the <F1> key, and it will display the relevant information.

Option	Choice	Description
System Date	N/A	Set the system date. Note that the 'Day' automatically changes when you set the date
System Time	N/A	Set the system time.
Processor Type	N/A	This item displays the CPU Type
Processor Speed	N/A	This item displays the CPU Speed
System Memory Speed	N/A	This item displays the memory speed

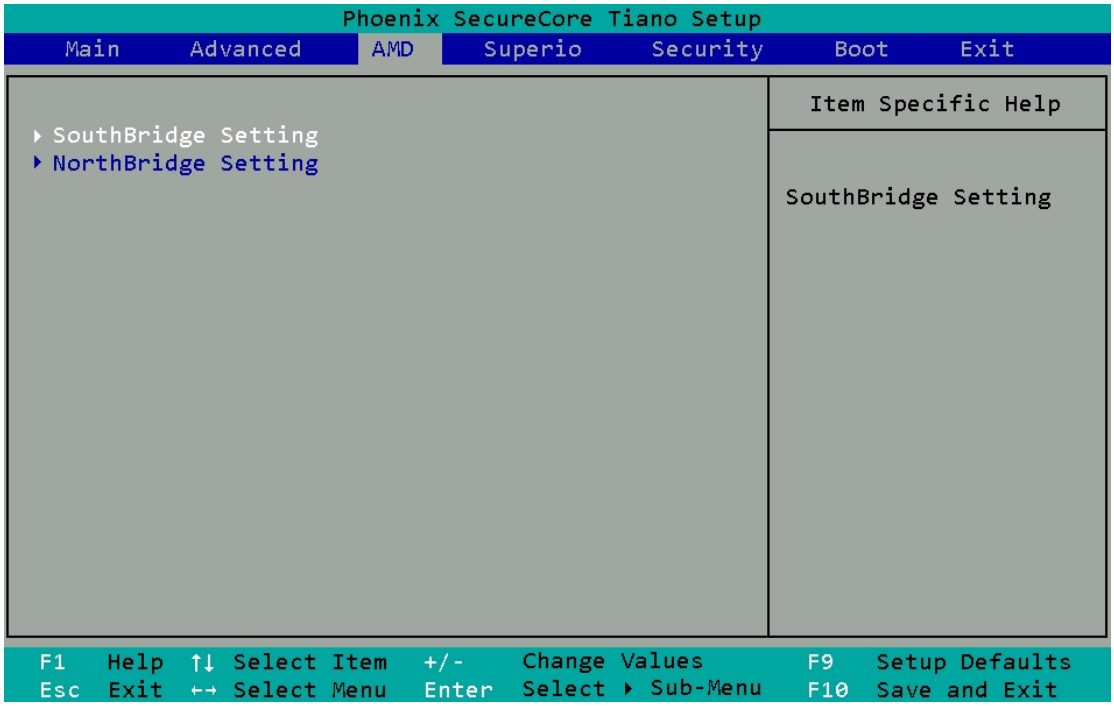
L2 Cache Ram	N/A	This item displays the L2 ache memory size
Total Memory	N/A	This item displays the memory size that used.
Memory Channel slot 0	N/A	This item displays the memory size that used On slot 0.
Memory Channel slot 1	N/A	This item displays the memory size that used On slot 1.

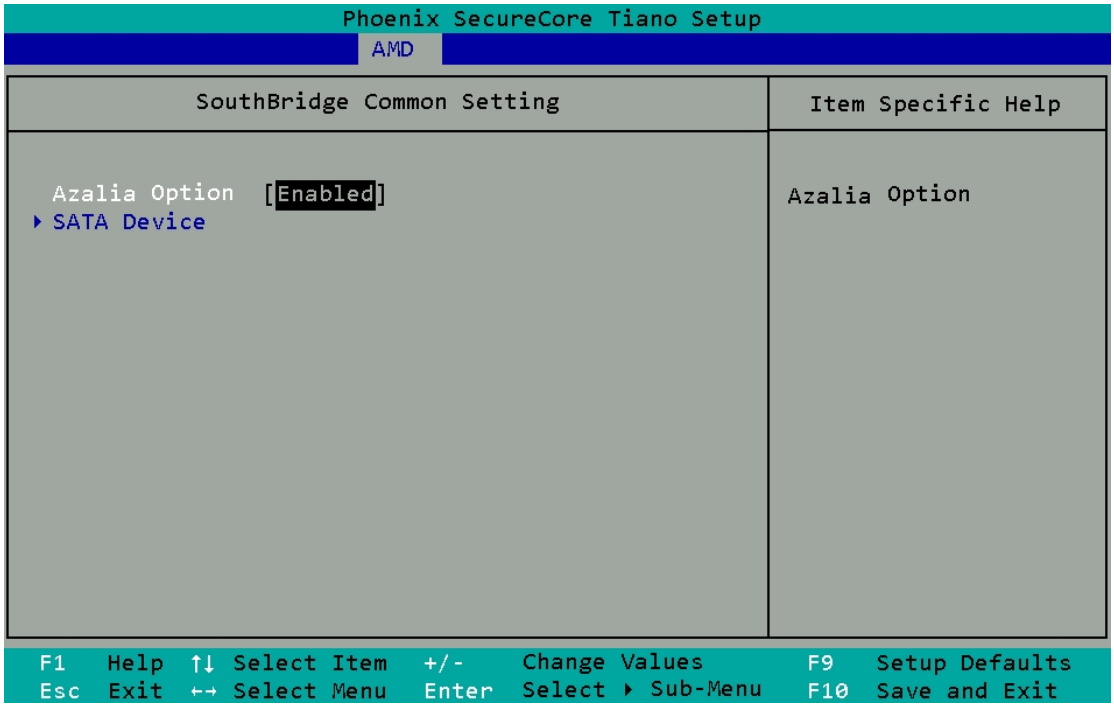
3.2 Advanced Chipset Setup

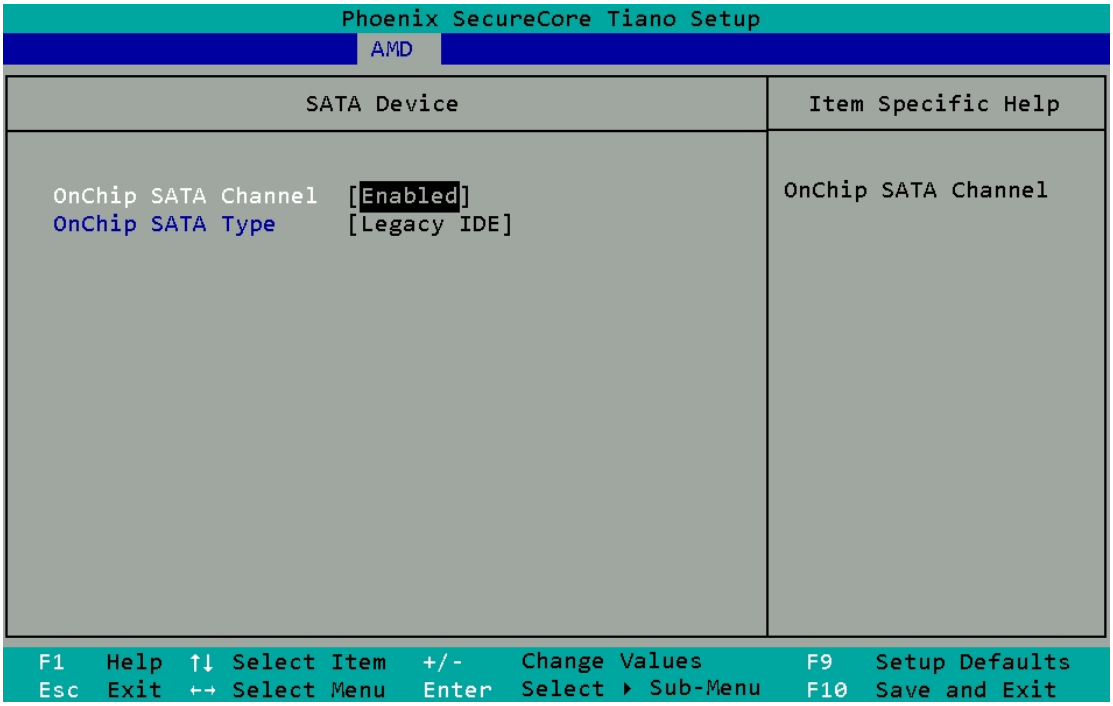


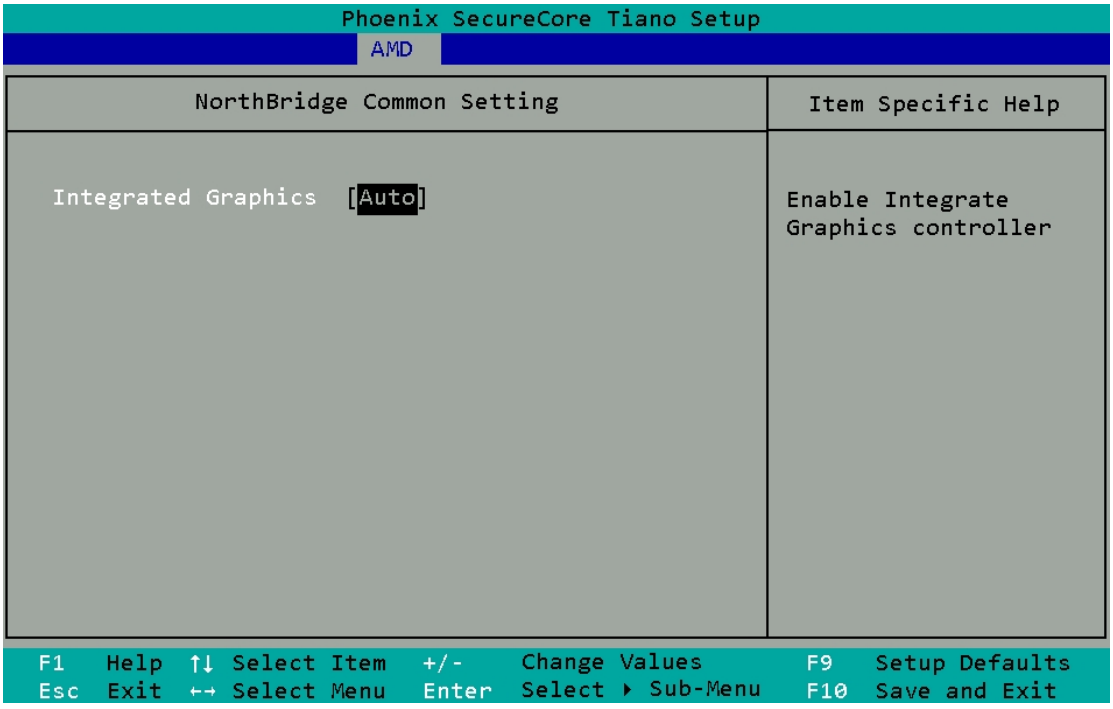
Option	Choice	Description
Quick Boot	Enabled Disabled	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Full Screen Logo Show	Enabled Disabled	Displays the full screen logo upon BIOS booting.

3.3 AMD Setup


Phoenix SecureCore Tiano Setup
Main Advanced AMD Superio Security Boot Exit
SouthBridge Setting
NorthBridge Setting
Item Specific Help
SouthBridge Setting
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit


Phoenix SecureCore Tiano Setup
AMD
SouthBridge Common Setting
Item Specific Help
Azalia Option [Enabled]
SATA Device
Azalia Option
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

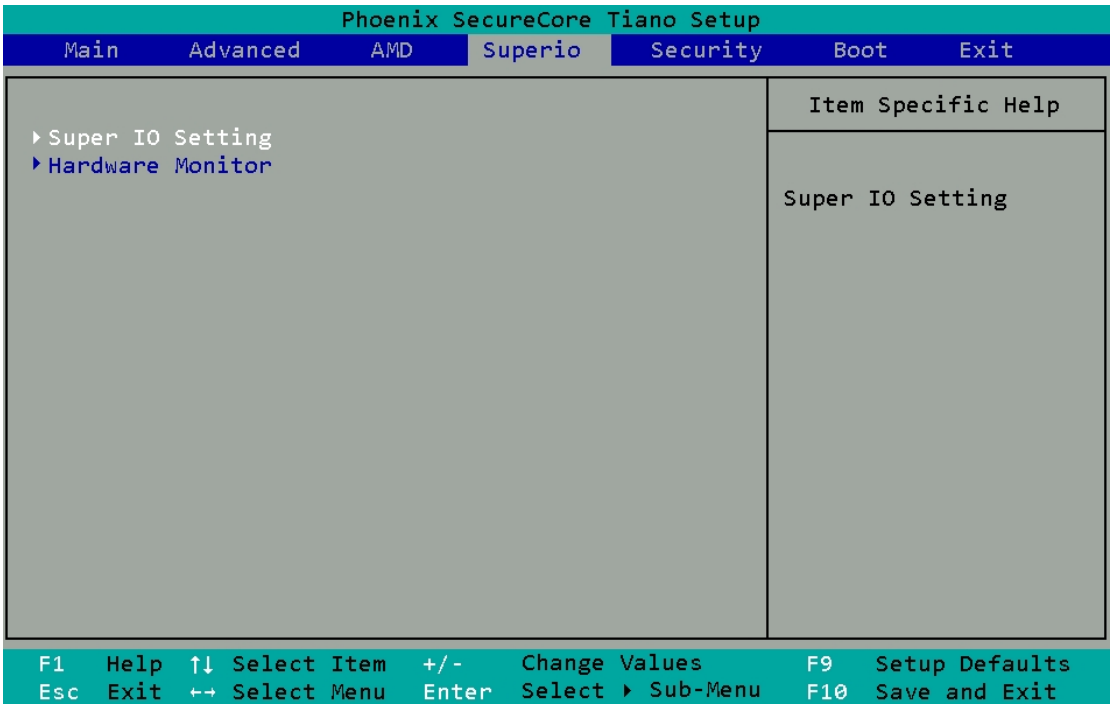

Phoenix SecureCore Tiano Setup
AMD
SATA Device
Item Specific Help
OnChip SATA Channel [Enabled]
OnChip SATA Type [Legacy IDE]
OnChip SATA Channel
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

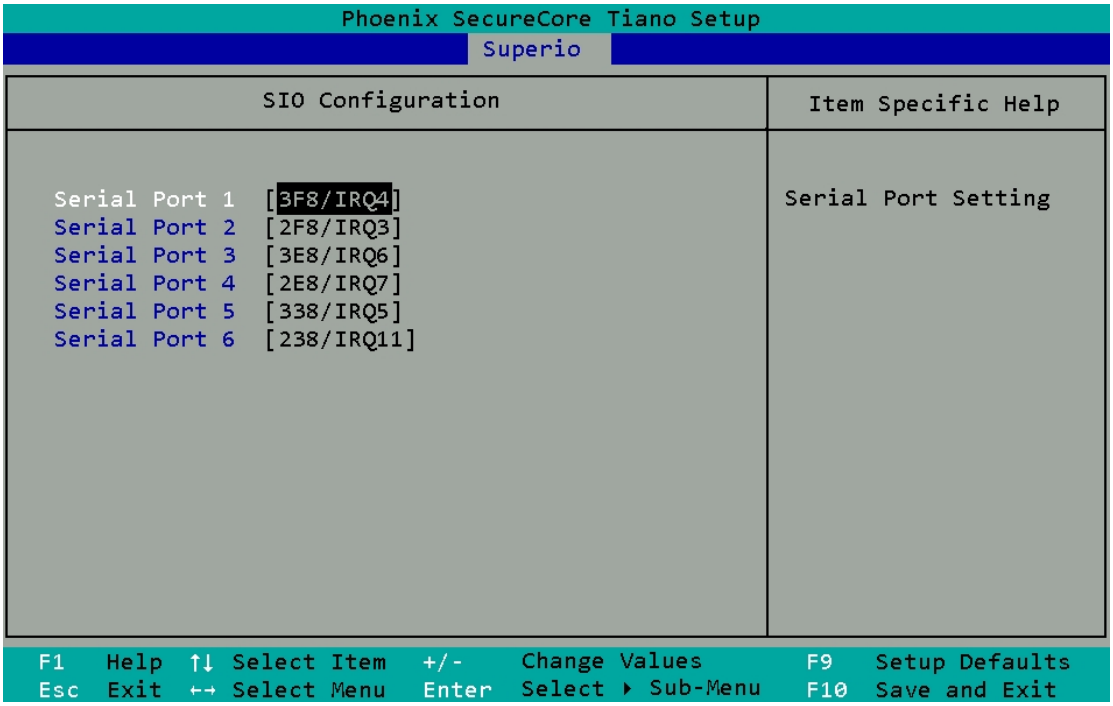

Phoenix SecureCore Tiano Setup
AMD
NorthBridge Common Setting
Item Specific Help
Integrated Graphics [Auto]
Enable Integrate Graphics controller
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

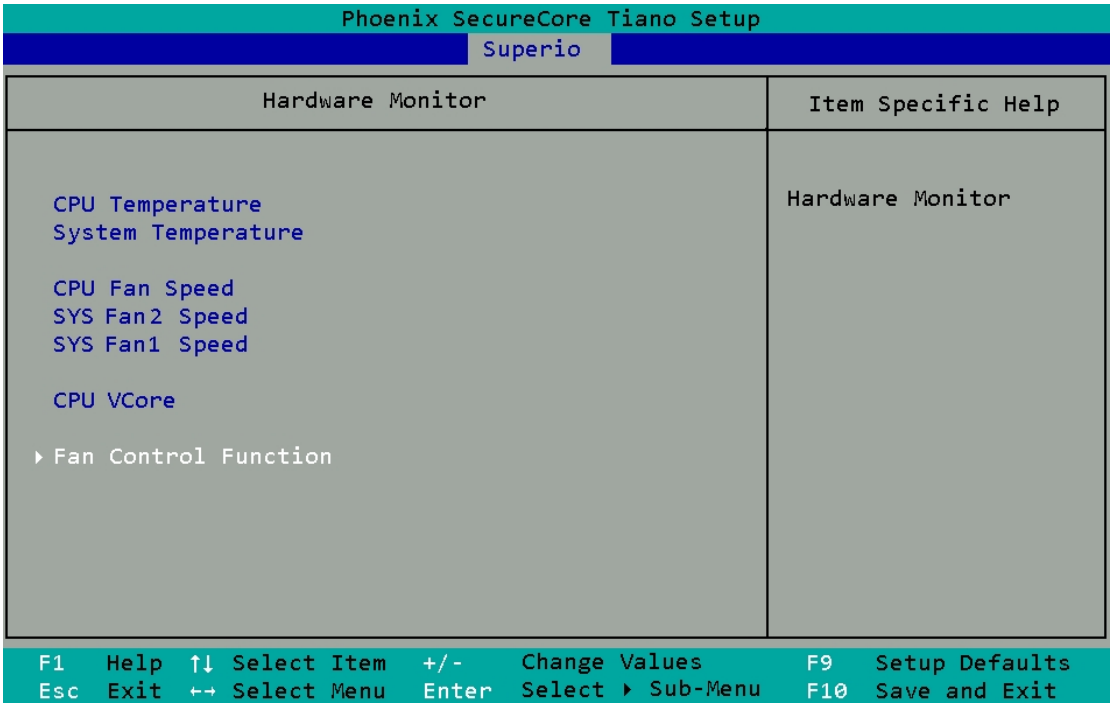
Option	Choice	Description
Azalia Option	Enabled Disabled	Enabled Enables onboard controller if audio device is detected Disabled Turn off onboard controller to allow external controller
OnChip SATA Channel	Enabled	Enabled Enables onboard SATA

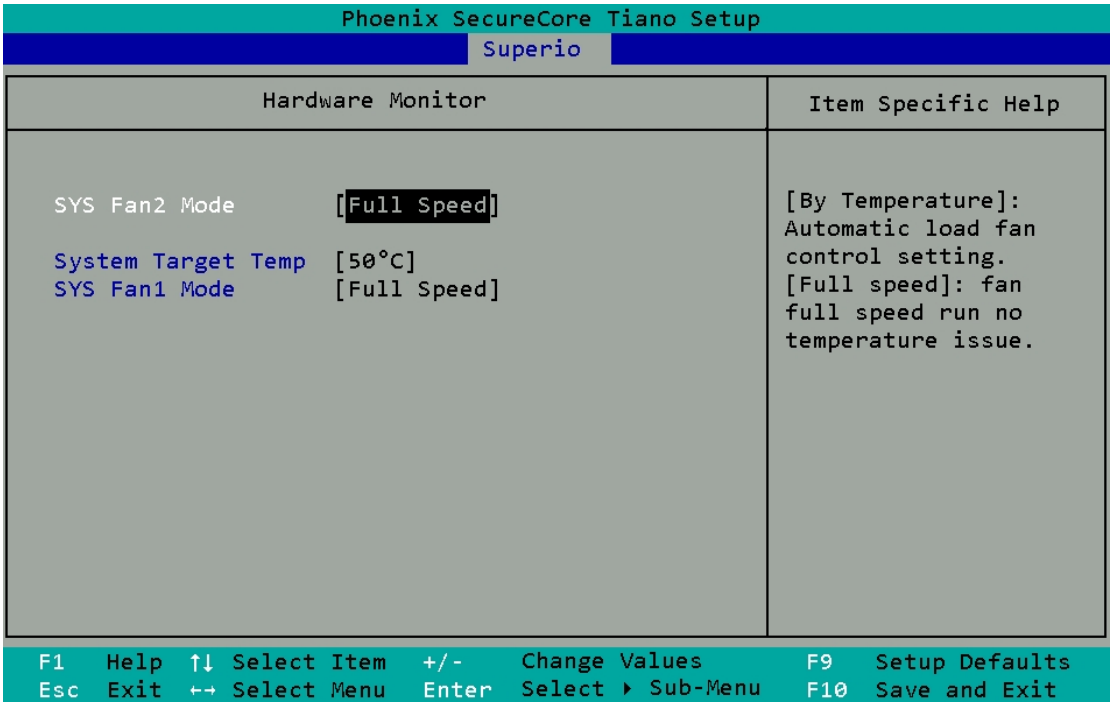
	Disabled	controller Disabled Turn off onboard SATA controller
OnChip SATA Type	AHCI Legacy IDE AHCI ID3494	N/A
Integrated Graphics	Auto Force	Auto: Onboard VGA Fram Buffer Size by the Main memory size Force: set fixed Onboard VGA Fram Buffer Size
UMA Fram Buffer Size	Auto 32M 64M 128M 256M 384M 512M 1G 2G	Select Onboard VGA Fram Buffer Size

3.4 Superio Setup




Phoenix SecureCore Tiano Setup
Superio
SIO Configuration
Item Specific Help
Serial Port 1 [3F8/IRQ4]
Serial Port 2 [2F8/IRQ3]
Serial Port 3 [3E8/IRQ6]
Serial Port 4 [2E8/IRQ7]
Serial Port 5 [338/IRQ5]
Serial Port 6 [238/IRQ11]
Serial Port Setting
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

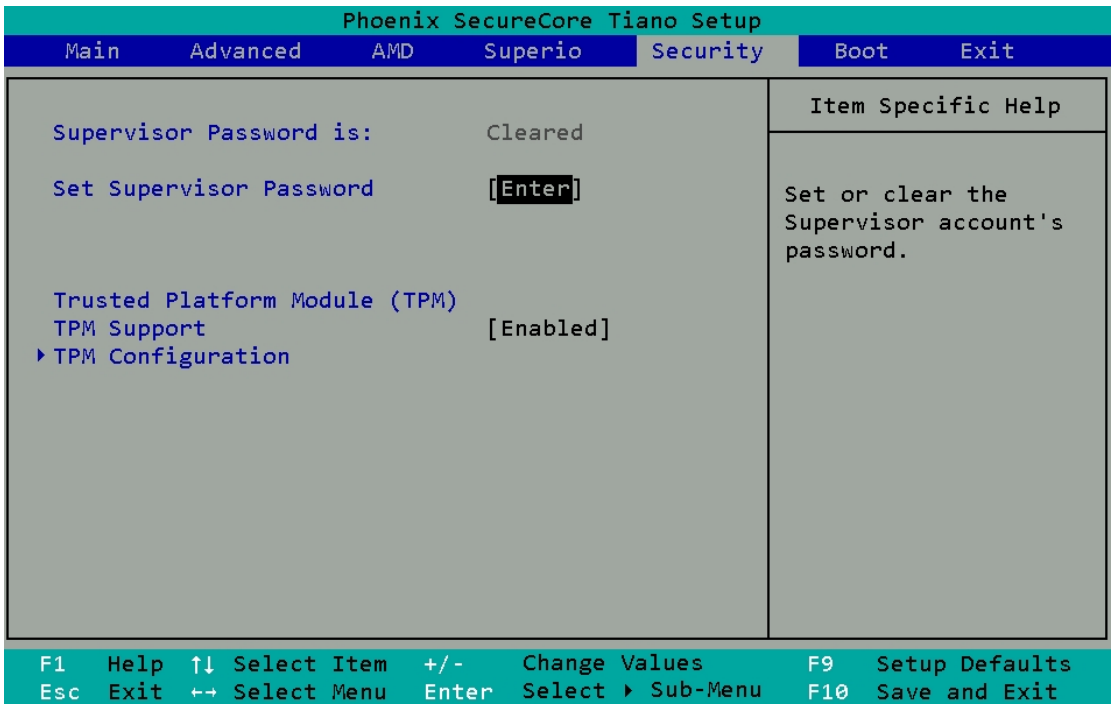

Phoenix SecureCore Tiano Setup
Superio
Hardware Monitor
Item Specific Help
CPU Temperature
System Temperature
CPU Fan Speed
SYS Fan2 Speed
SYS Fan1 Speed
CPU VCore
▸ Fan Control Function
Hardware Monitor
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

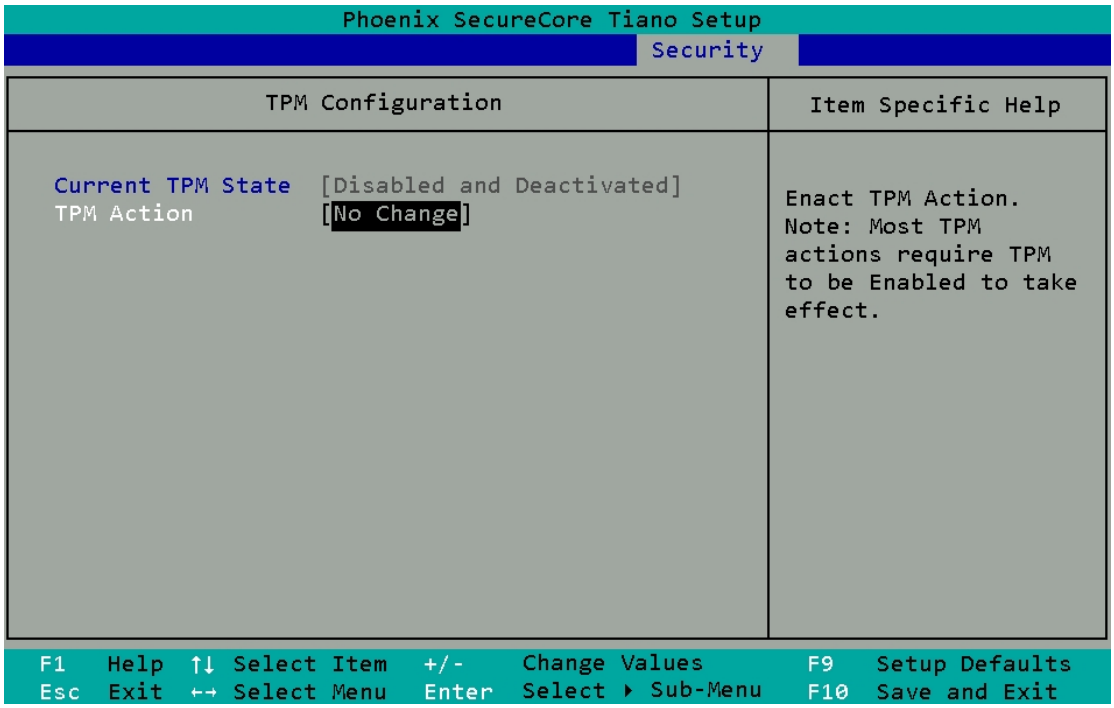

Phoenix SecureCore Tiano Setup
Superio
Hardware Monitor
Item Specific Help
SYS Fan2 Mode [Full Speed]
System Target Temp [50°C]
SYS Fan1 Mode [Full Speed]
[By Temperature]: Automatic load fan control setting.
[Full speed]: fan full speed run no temperature issue.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Option	Choice	Description
Serial Port 1/2/3/4/5/6	Disabled 3F8/IRQ4 2F8/IRQ3 3E8/IRQ6 2E8/IRQ7 338/IRQ5 238/IRQ11	Sets the base I/O port address and IRQ for the onboard device
CPU Temperature	N/A	These read-only fields show the functions of the hardware thermal sensor by CPU thermal diode that monitors the chip blocks to ensure a stable system.
System Temperature	N/A	Show you the current system temperature.
CPU Fan Speed	N/A	Show you the CPU Fan Speed.
SYS Fan1/2 Speed	N/A	Show you the System Fan1/2 Speed.

CPU VCore	N/A	Show you the voltage of Vcore.
SYS Fan1/2 Mode	Full Speed By Temperature	Faull: Fan Speed full on By Temperature: Fan Speed by system temperature
System Target Temp	40 50 60	N/A

3.5 Security Setup

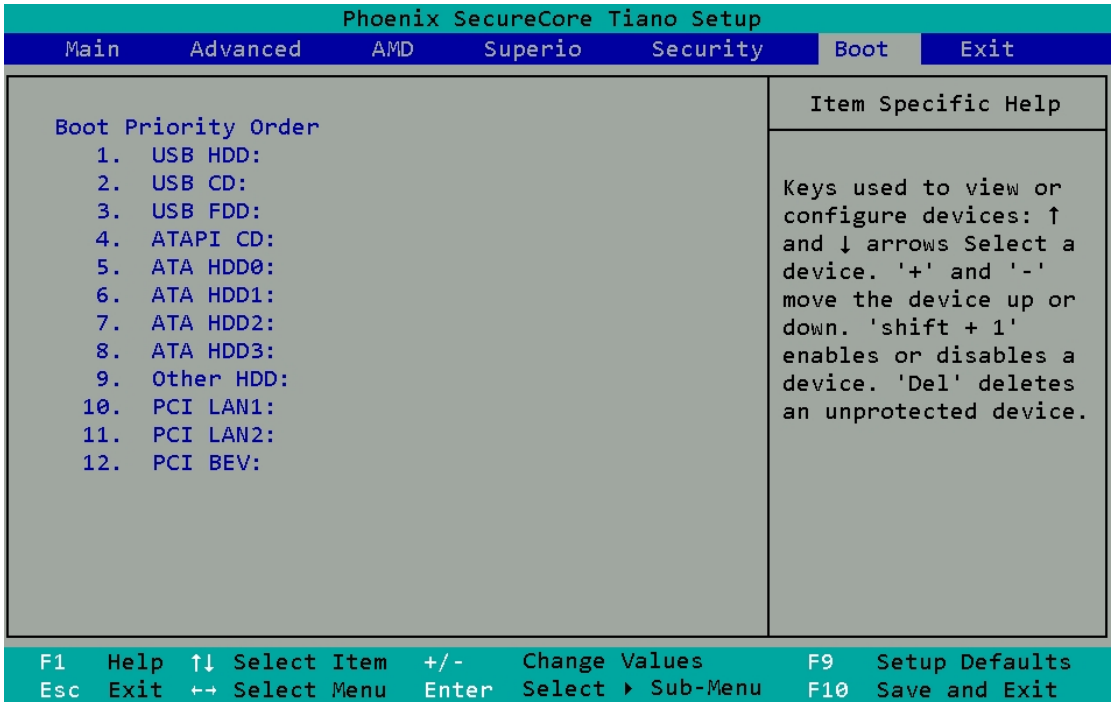

Phoenix SecureCore Tiano Setup
Main Advanced AMD Superio Security Boot Exit
Supervisor Password is: Cleared
Set Supervisor Password [Enter]
Trusted Platform Module (TPM)
TPM Support [Enabled]
TPM Configuration
Item Specific Help
Set or clear the Supervisor account's password.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit


Phoenix SecureCore Tiano Setup
Security
TPM Configuration
Current TPM State [Disabled and Deactivated]
TPM Action [No Change]
Item Specific Help
Enact TPM Action. Note: Most TPM actions require TPM to be Enabled to take effect.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

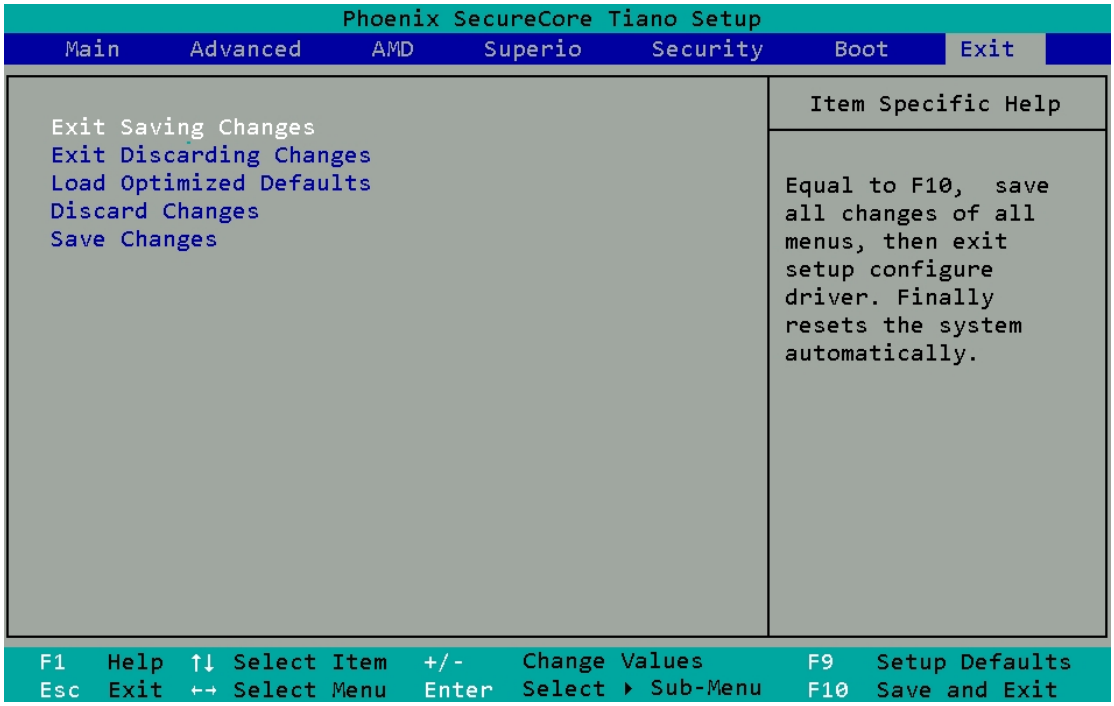
Option	Choice	Description
Supervisor Password is	N/A	The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
Set Supervisor Password	Pressing <Enter> on this item for confirmation: **ENTER PASSWORD:**	When a password has been enabled, you will be prompted to enter your password every time you try to enter Setup. This prevents unauthorized persons from changing any part of your system configuration. Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previous password from the CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password. To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm that the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.
TEMP Support	Enabled Disalbed	For Onboard TPM Module Function.
Current TPM State	N/A	Show Current TPM States
TPM Action	No Change Enable Disable Activate Deactive Clear Enable and Activate Disable and Deactivate Set Owner Install, with state=True Set Owner Install, with state=False Enable, Activate, and Set Owner Install with	N/A

	state=True Disable, Deactivate, and Set Owner Install, with state=False Clear, Enable, and Activate Require PP for Provisioning Do not require PP for provisioning Require PP for clear Do not require PP for clear Enable, Activate, and Clear Enable, Activate, Clear, Enable, and Activate	

3.6 Boot setup


Phoenix SecureCore Tiano Setup
Main
Advanced
AMD
Superio
Security
Boot
Exit
Boot Priority Order
1. USB HDD:
2. USB CD:
3. USB FDD:
4. ATAPI CD:
5. ATA HDD0:
6. ATA HDD1:
7. ATA HDD2:
8. ATA HDD3:
9. Other HDD:
10. PCI LAN1:
11. PCI LAN2:
12. PCI BEV:
Item Specific Help
Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-' move the device up or down. 'shift + 1' enables or disables a device. 'Del' deletes an unprotected device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

3.7 Exit Setup


Phoenix SecureCore Tiano Setup
Main Advanced AMD Superio Security Boot Exit
Exit Saving Changes
Exit Discarding Changes
Load Optimized Defaults
Discard Changes
Save Changes
Item Specific Help
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

option	Choice	Description
Exit Saving Changes	Pressing <Enter> on this item for confirmation:	Exit BIOS Setup and Save Changes BIOS Setting.
Exit Discarding Changes	Pressing <Enter> on this item for confirmation:	Exit BIOS Setup and Without Save Changes BIOS Setting.

Load Optimized Defaults	When you press <Enter> on this item you get a confirmation dialog box with a message like this:	Press 'Y' to load the default values that are factory-set for optimal-performance system operations.
Discard Changes	Pressing <Enter> on this item for confirmation:	N/A
Save Changes	Pressing <Enter> on this item for confirmation:	Save Changes BIOS Setting but without exit BIOS Setup.

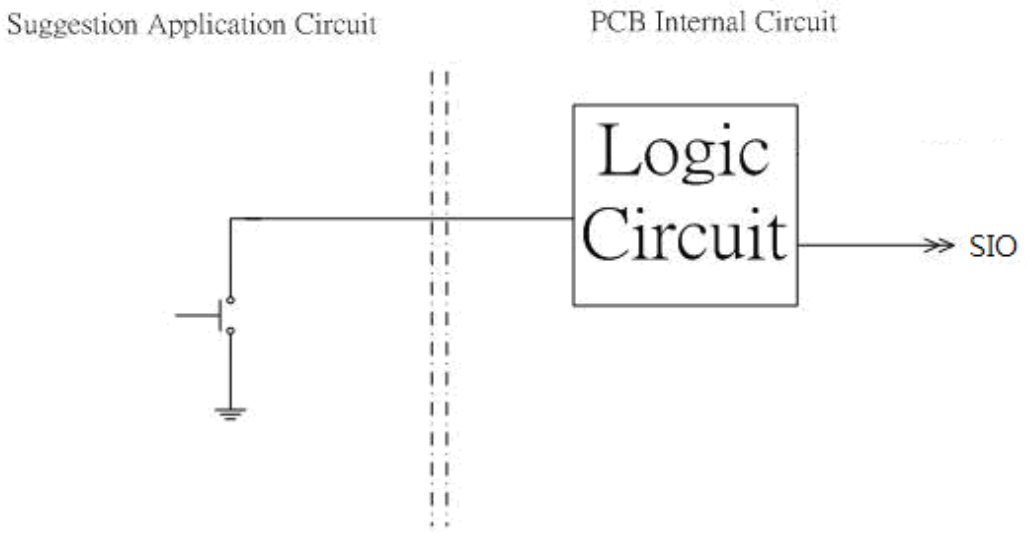
Chapter 4 Function Description

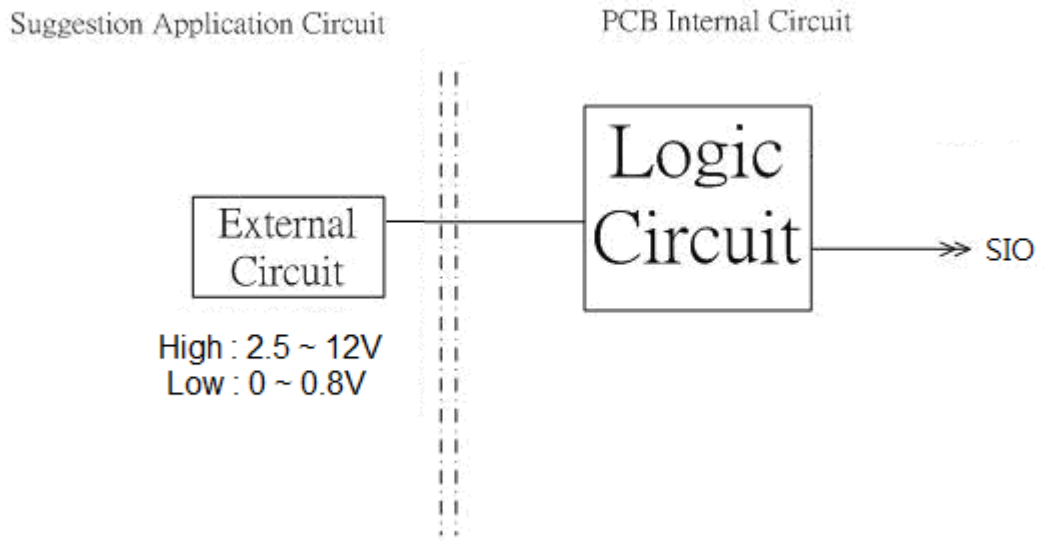
4.1 DC Power input connection

AR-B7400 needs +12V/+24V to power the board.

4.2 Digital Inputs

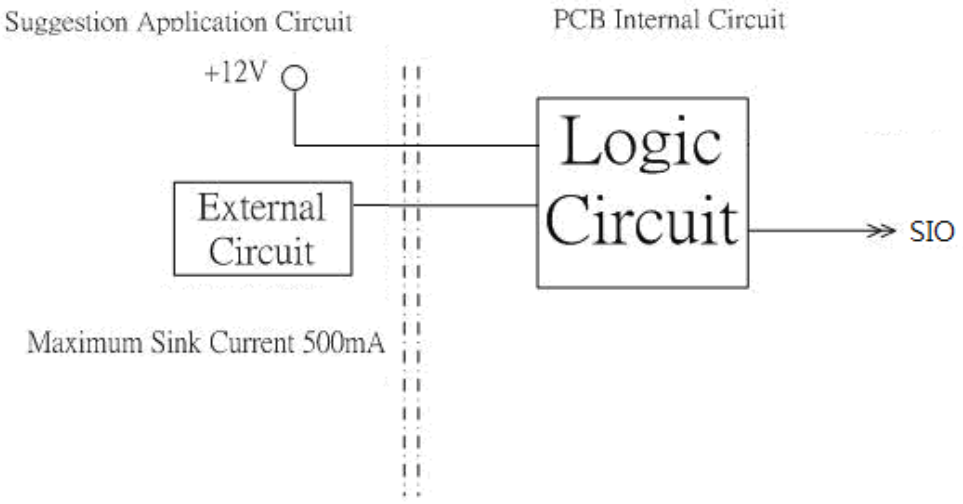
There are 4 clamped diode protection digital inputs on GPIO_COM1 connector. You can read the status of any input through the software API. These digital inputs are general purpose input. You can define their purpose for any digital input function. The detailed information please refers to Software Programming Guide for how to use the API.
Following diagrams state how to connect the digital inputs to devices on the embedded system.





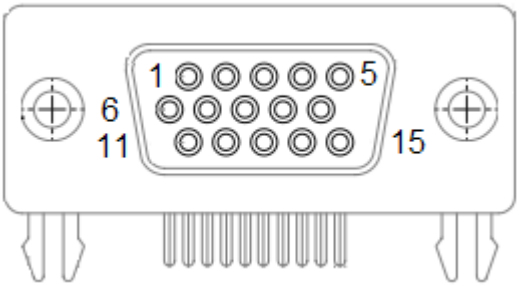
4.3 Digital Outputs

There are 4 clamped diode protection digital outputs on GPIO_COM1 connector. You can control the output status of these digital outputs through the software API. The four digital outputs are capable sink maximum 500 mA current for each channel and maximum output voltage is 12V. The output reference voltage of device, please connect to GPIO #VCC12V(Pin15). These digital outputs are general purpose outputs. The detailed information please refers to Software Programming Guide for how to use the API.
Following diagrams state how to connect the digital outputs to devices on the embedded system.



GPIO Pin Define:

PIN	SIGNAL	PIN	SIGNAL
1	GPO0	2	GPO1
3	GPO2	4	GPO3
5	GND	6	GND
7	GND	8	GND
9	GND	10	GND
11	GPI4	12	GPI5
13	GPI6	14	GPI7
15	VCC12A		

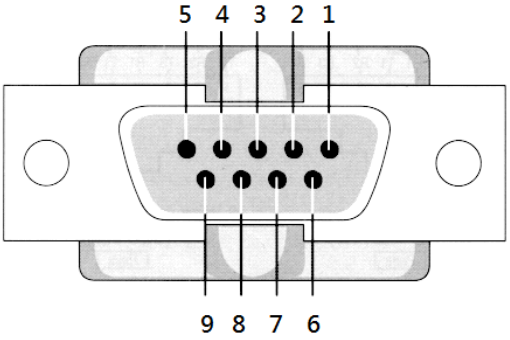


4.4 Watchdog Timer

If you set a watchdog timer, you can use it to reset the system when system hangs up due to hardware issue. After you set the watchdog timer, the software shall re-set the timer to re-start a new cycle before it time-out. Please refer to Chapter 5 Software Installation and Programming Guide for how to set the watchdog timer.

4.5 RS-232 Ports

There are three RS-232 ports on the AR-B6003. The COM1/COM3/COM4 are connected through a male D-Sub 9-pin connector for serial communication. The COM2 is connected through a cable. Users need to plug into RS-232 or RS-422/485 connector. For RS-422/485, please refer to SW2, SW4 and SW5 setting. The following diagram is their pin definition and signal.



Pin number	RS-232 male
1	DCD
2	TXD
3	RXD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	RI

CN_RS232_1: For RS-232 Function

Pin	SIGNAL
1	DSR
2	DCD
3	RTS
4	SIN
5	CTS
6	SOUT
7	RI
8	DTR
9	NC
10	GND

CN_RS422_485_1: For RS-422, RS-485

Pin	SIGNAL
1	NC
2	485_422_TX+
3	NC
4	485_422_TX-
5	422_RX2-
6	NC
7	422_RX2+
8	NC
9	NC
10	GND

4.6 Serial ATA (SATA)

There are 2 SATA 2.5 ports on the AR-B7400. There are also two SATA power connectors for the SATA hard disks. The SATA power cable is an optional accessory. If you need a SATA power connector, please contact your Acrosser sales representative for the quotation.

4.7 USB

There are 6 USB 2.0 interfaces on the AR-B7400. Four USB connectors are located on the edge of the board. The other two USB ports are supported by two 5 pin internal connector. You need a special cable for using these two USB ports and they are optional accessories.

Chapter 5 Driver And Utility Installation

5.1. Driver CD Interface Introduction

Acrosser provides the driver CD including the drivers, utilities, applications and documents. For Windows environment, it can be guided by the setup program; for Linux environment, the related files can be found at folder “ACEB7400\Linux”. The TPM drivers for Linux are not included in this disc.

Once putting into optical driver, it will run automatically. The driver CD will also detect the MB information to see if they are matched. The following error messages appear if you get an incorrect driver CD.

It indicates that board information is not available.

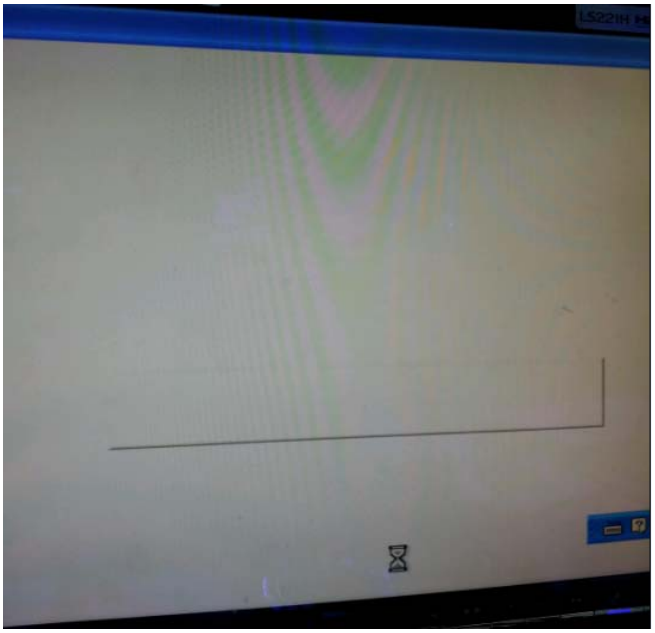
It indicates that the program gets wrong board information.

5.1.1 Driver Page

Click the item, all the drivers will be selected.

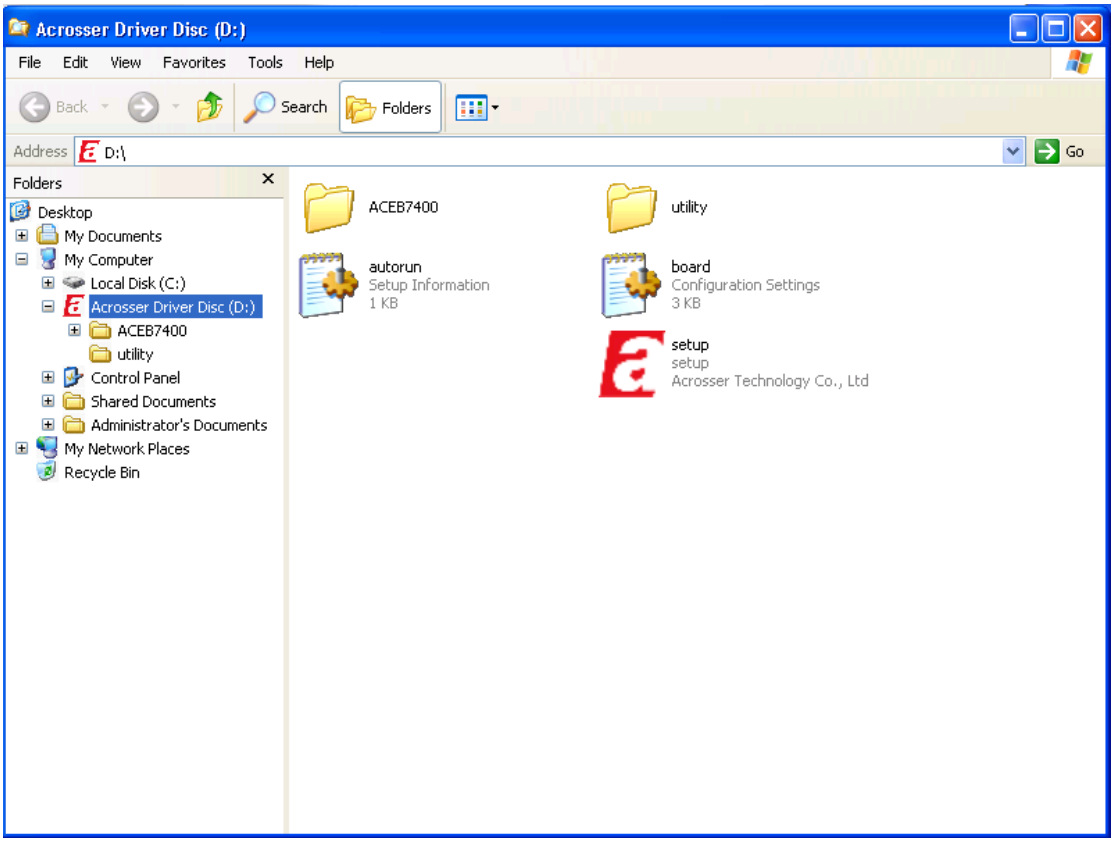
Click the item, all selected items will be cancelled.

Click the “Install” icon to install the selected drivers.



ps: It is normal to get temporary blank screen while installing Chipset driver since VGA device is switching resolution mode and data. It will turn back within 5~10 seconds.

Click the item to browse the CD contents.



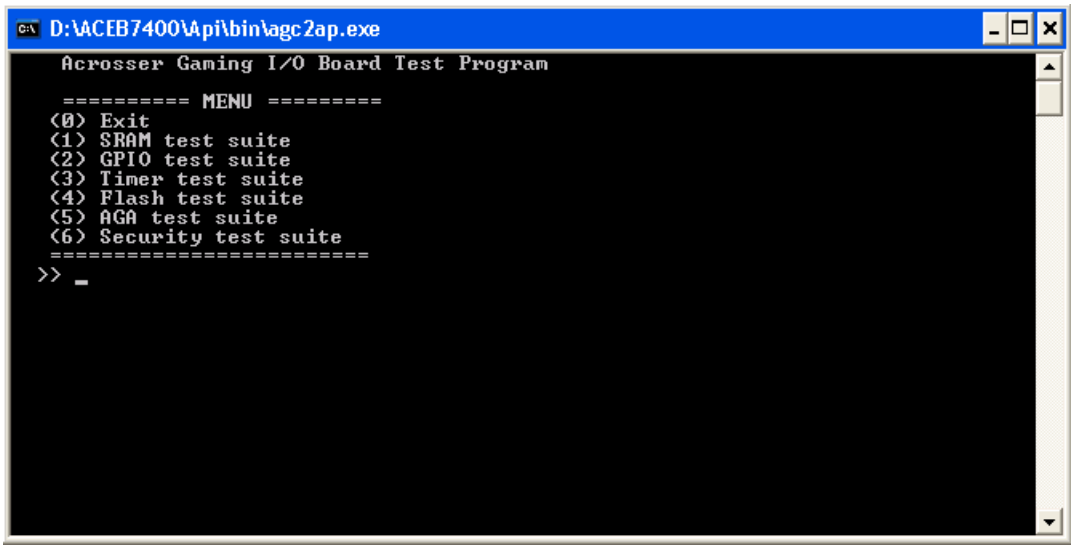
Click the icon to close the program.

5.1.2 Utility Page

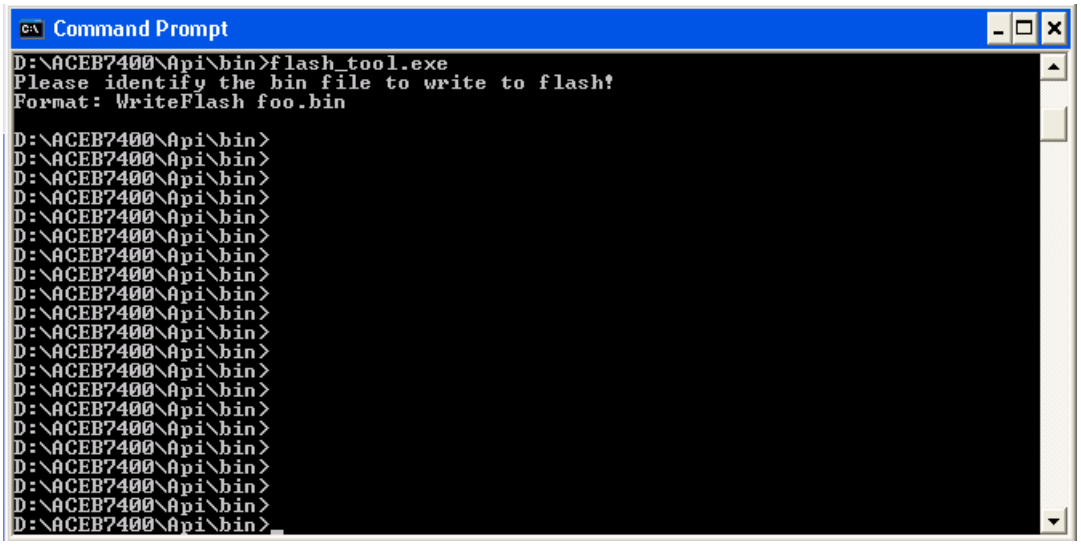
There are three utilities for ACE-B7400. AGC test utility is used to test on board gaming function. Flash tool is used to update on board flash data. Sample code contains the windows sample code to use Acrosser's APIs. The detailed information about how to use APIs please refers to Software Programming Guide.

- Double click the “AGC test utility” to run the utility.

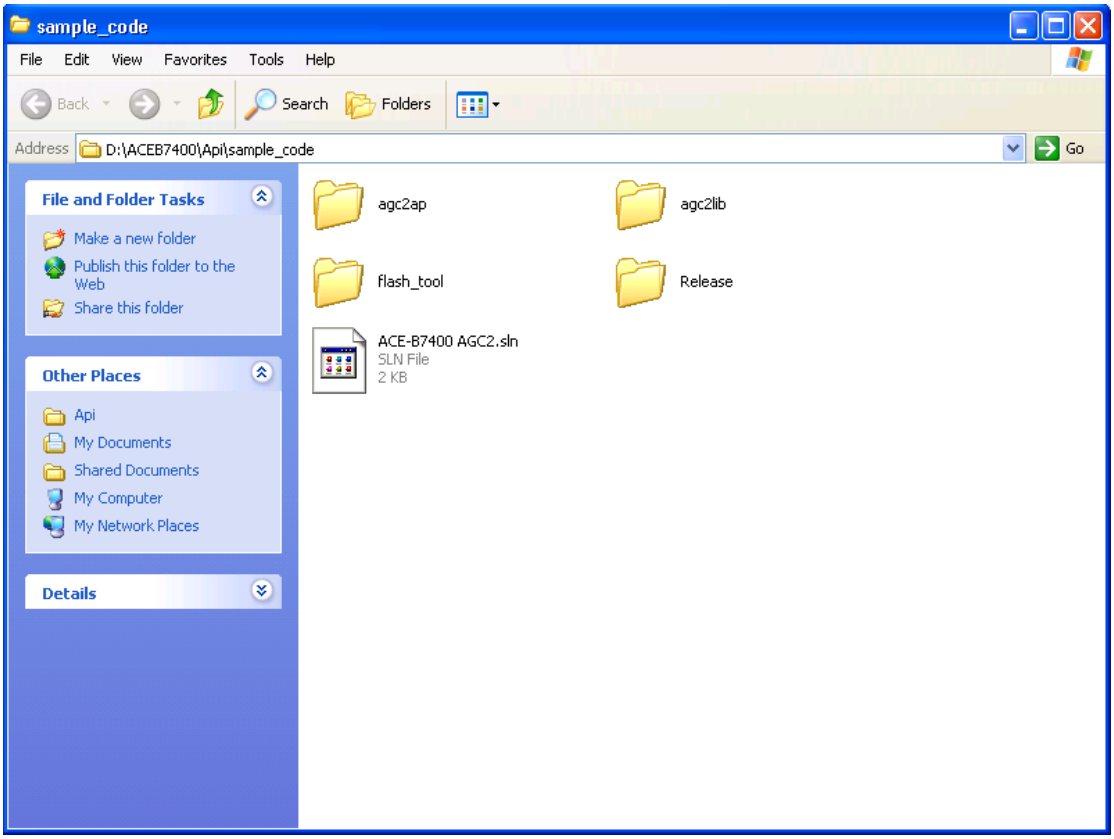
You have to install AGC driver in application tab first in order to run AGC test utility successfully.



- Please run flash_tool.exe in command line. The tool will read the content of the assigned file and write it to on board flash.



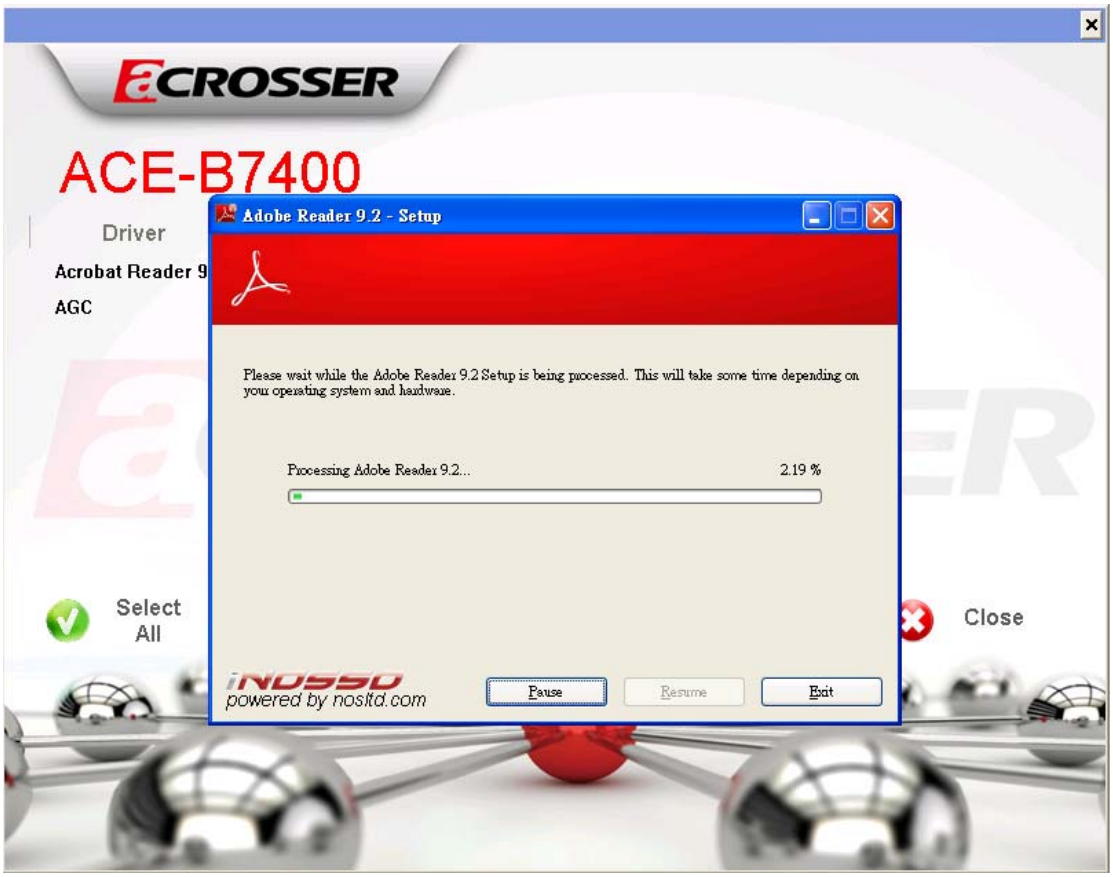
- Double click on “sample code” will bring out the file explorer point to the sample code folder.



5.1.3 Application Page

There is one application for Acrobat reader installing.

- Double click the “Acrobat Reader 9.2” to install the application.



- Double click the “AGC” to install the AGC driver. It will install siliently.

5.1.4 Document Page

This page will provide Acrosser board and system user manual. Please remember to install the Acrobat Reader before you read the manual.

- Double click the manual item to read the user manual.
- Please install the Acrobat Reader when you see the message.

ECROSSER
ACE-B7400
Driver
Utility
Application
Document
System User Manual
Board User Manual
setup
Please install pdf reader before open user document!
確定
Select All
Clear All
Install
Browse Disc
Close

5.2 Windows XP 32bit Driver Installation

5.2.1 Please put the driver disk to optical driver. The program will appear on the screen. Please click the “Select All” icon.

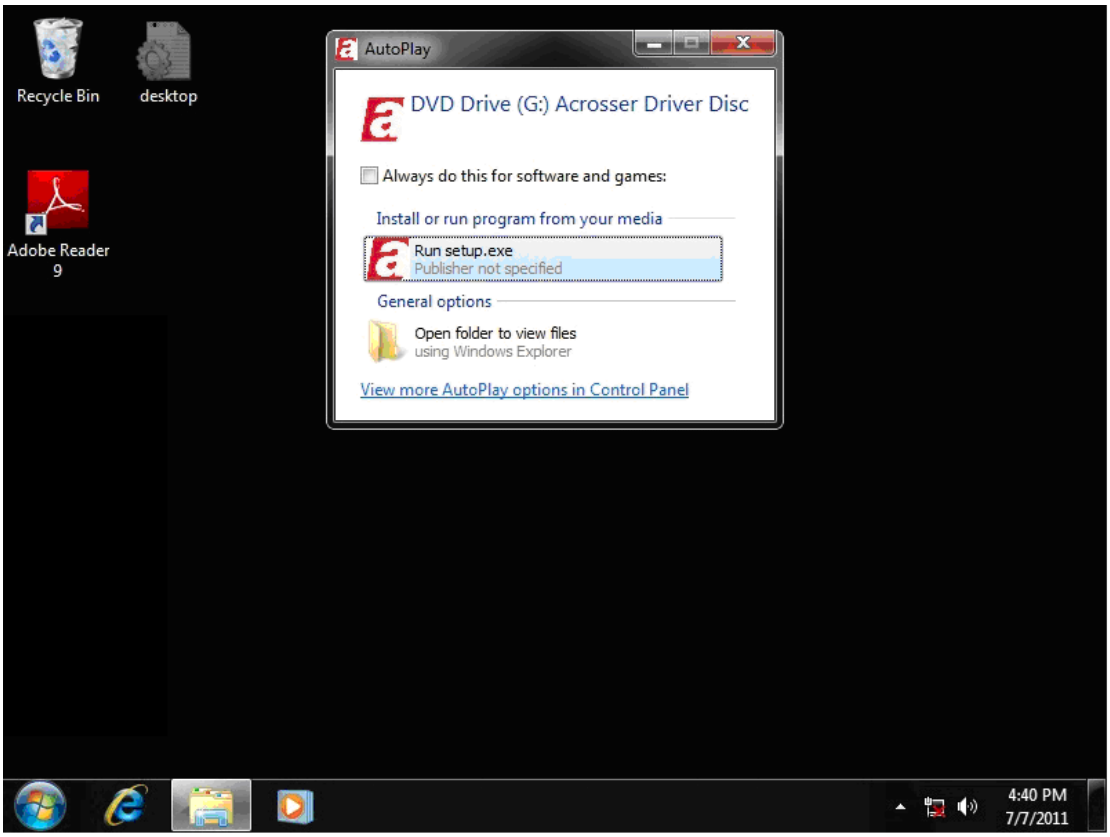
5.2.2 Click the “Install” icon to install the drivers.

5.2.3 Finish the driver installation. Please click “Yes” to restart the system.

5.3 Windows 7 32/64bit Driver Installation

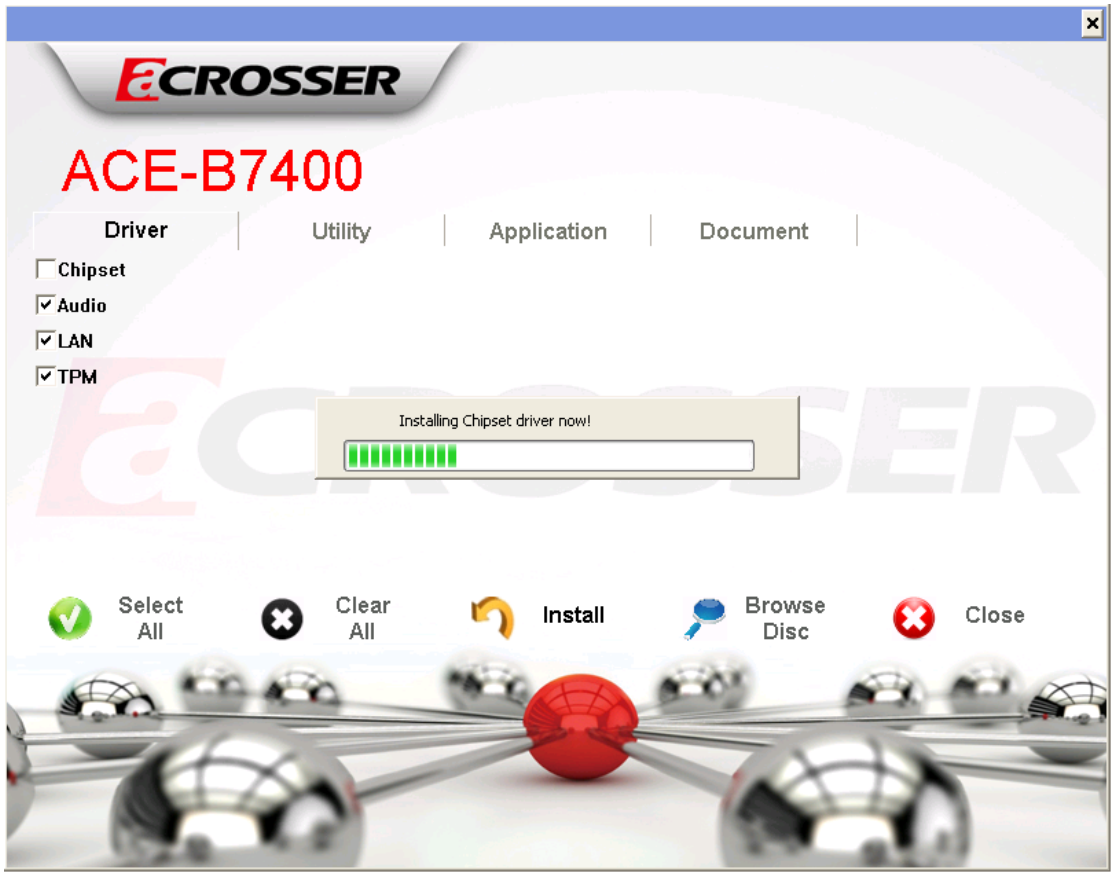
Please be noted. Since windows 7 64 bit edition needs certified digital signing to load hardware drivers, in order to run our product correctly, the installation program will automatically enable test signing feature if it runs under windows 7 64 bit environment.

5.3.1 Please put the driver disk to optical driver. Then click the “Run setup.exe” to run the install program.



5.3.2 The program will appear on the screen. Please click the “Select All” icon.

5.3.3 Click the “Install” icon to install the drivers.



5.3.4 Finish the driver installation. Please click “Yes” to restart the system.

Chapter 6 Software Installation and Programming Guide

6.1 Introduction

ACE-B7400 is an All-in-One gaming control box based on AMD 780E platform. It is designed for slot machine and AWP machine which requires powerful 3D video performance. Besides powerful integrated graphic controller, ACE-B7400 integrates all gaming control features.

In order to ease the customer's operation on ACE-B7400, Acrosser provides device driver, application interface (API), and source code of demo application. The provided software is available on both Windows and Linux. The API can be classified into two subclasses: Acrosser Gaming Core V2 (AGC2) and Acrosser Gaming Agent V2 (AGA2). The details are described in Chapter 2. All the provided software can be found in the bundled disc.

6.2 Application Interface

This chapter describes the details of the provided API function. The return value of the API function is listed on Chapter 3.

6.2.1 AGC2

6.2.2 General Usage

6.2.2.1 Register AGC2 Resource

- Description

  This function is used to register the AGC2 related resource. AGC2 has to be registered by this function before other functions are called.

- Syntax

  u32 registerAgc (void)

- Argument
  - None.

6.2.2.2 Release AGC2 Resource

- Description

  This function is used to release the resource of AGC2.

- Syntax

releaseAgc (void)

- Argument
  - None.

6.2.2.3 Get Event Buffer

- Description

  Get an event from device event queue.

- Syntax

  getEventBuf (Event* event)

- Argument
  - event: The memory address to put the Event structure from queue.

- Event structure
  - u8 type: the types of event
    - If type is equal to 1, the event is a general purposed input event.
    - If type is equal to 2, the event is a timer timeout event.
    - If type is equal to 3, the event is a pulse generator finished event.
    - If type is equal to 4, the event is a counter overflow event.
    - If type is equal to 5, the event is a counter timeout event.
  - u8 channel: the channel index or timer index which occurred the event.
    - For a general purposed input event, channel stores the channel index.
    - For a timer timeout event, channel stores the timer index.
    - For a pulse generator finished event, channel stores the pulse generator index.
    - For a counter overflow event, channel stores the counter index.
    - For a counter timeout event, channel stores the counter index.
  - u32 value: the related value of event.
    - For a general purposed input event, value stores the channel high/low value.
    - For a timer timeout event, it is zero.
    - For a pulse generator finished event, it is zero.
    - For a counter overflow event, value stores the current counter value.
    - For a counter timeout event, value stores the current counter value.

6.2.2.4 Get Event Count

- Description

Get how many events staying in device event queue.

- Syntax
  getEventCnt (u16* count)
- Argument
  - count: The memory address to put the number of events in queue.

6.2.2.5 Clear Event Count

- Description
  Remove all queued events in device event queue and also reset counter to zero.
- Syntax
  clrEventBuf (void)
- Argument
  - None.

6.2.2.6 Set Callback Function

- Description
  Set the callback function pointer.
- Syntax
  setCallBack (AgcCallback agcCallback)
- Argument
  - agcCallback: The callback function pointer.
- Example

```
void IOIST(Event event)

{

    switch(event.type) {

    case EVENT_CNTOF:

      printf("Get counter reach target event: CNT%d value %d.\n", event.channel + 1, event.value);

      break;

    case EVENT_CNTTO:

      printf("Get counter timeout event: CNT%d value %d.\n", event.channel + 1, event.value);

      break;

    case EVENT_GPI:

      printf("Get input event: channel %d is %s.\n", event.channel, event.value ? "on" : "off");

      break;
```

```
        case EVENT_PG:
            printf("Get pulse generator finish event: PG%d.\n", event.channel + 1);
            break;
        case EVENT_TIMER:
            printf("Get timer finish event: Timer%d.\n", event.channel + 1);
            break;
    }
}
```

```
    Errbox = registerAgc( );
    if(Errbox != 0)
        printf(" Register Card Error\n");
    setCallBack( IOIST );
```

6.2.3 SRAM

6.2.3.1 Set SRAM Mode

- Description

  This function is used to set SRAM operation mode.

- Syntax

  setSramMode(u8 mode)

- Argument
  - mode: SRAM mode. 0 indicates independent mode; 1 indicates replicated mode.

6.2.3.2 Get SRAM Mode

- Description

  This function is used to get SRAM operation mode.

- Syntax

  getSramMode(u8* mode)

- Argument
  - mode: The memory address to put the SRAM operation mode.

6.2.3.3 Read Byte from Memory

- Description

  This function is used to read SRAM data in byte alignment.

- Syntax

getSramByte (u32 offset, u8* value)

- Argument
  - offset: SRAM offset to read.
  - value: The memory address to put SRAM data.

6.2.3.4 Read Word from Memory

- Description

  This function is used to read SRAM data in word alignment.

- Syntax

  getSramWord (u32 offset, u16* value)

- Argument
  - offset: SRAM offset to read (must in word alignment).
  - value: The memory address to put SRAM data.

6.2.3.5 Read Double Word from Memory

- Description

  This function is used to read SRAM data in double word alignment.

- Syntax

  getSramDword (u32 offset, u32* value)

- Argument
  - offset: SRAM offset to read (must in double word alignment).
  - value: The memory address to put SRAM data.

6.2.3.6 Write Byte to Memory

- Description

  This function is used to write SRAM data in byte alignment.

- Syntax

  setSramByte (u32 offset, u8 value)

- Argument
  - offset: SRAM offset to write
  - value: Value to write to SRAM.

6.2.3.7 Write Word to Memory

- Description

  This function is used to write SRAM data in word alignment.

- Syntax

  setSramWord (u32 offset, u16 value)

- Argument
  - offset: SRAM offset to write (must in word alignment)
  - value: Value to write to SRAM.

6.2.3.8 Write Double Word to Memory

- Description

  This function is used to write SRAM data in double word alignment.

- Syntax

  setSramDword (u32 offset, u32 value)

- Argument
  - offset: SRAM offset to write (must in double word alignment)
  - value: Value to write to SRAM.

6.2.3.9 Read Memory Block

- Description

  This function is used to read memory with a specified length.

- Syntax

  getSramBlock (u32 offset, u8* buffer, u32 size)

- Argument
  - offset: SRAM offset to read
  - buffer: The start address of memory buffer to put SRAM data.
  - size: The memory block size (in byte) to read.

6.2.3.10 Write Memory Block

- Description

  This function is used to write data to memory with a specified length.

- Syntax

  setSramBlock (u32 offset, u8* buffer, u32 size)

- Argument
  - offset: SRAM offset to write
  - buffer: The start address of data buffer to write to SRAM.
  - size: The memory block size (in byte) to write.

6.2.4 General Purpose Input/Output

6.2.4.1 Get Channel Status

- Description

  This function is used to get the status of the selected I/O channel.

- Syntax
  getChStatus (i32 ch, u32* status)
- Argument
  - ch: Channel number.
  - status: The memory address to put channel status. For input channel, 0 indicates open circuit; 1 indicates closed circuit. For output channel, 0 indicates switch off; 1 indicates switch on.

6.2.4.2 Set Input Channel Debounce Time

- Description
  Set the debounce time for the selected channel (in ms).
- Syntax
  setDiDebounce (i32 ch, u8 time)
- Argument
  - ch: Input channel number.
  - time: The de-bounce time. 0 indicates the debounce feature is disabled; others indicate the debounce time in ms, e.g., 1 means debounce time is 1 ms.

6.2.4.3 Get Input Channel Debounce Time

- Description
  Get the debounce time for the selected channel (in ms).
- Syntax
  getDiDebounce (i32 ch, u8* time)
- Argument
  - ch: Input channel number.
  - time: The memory address to put the debounce time value. 0 indicates the debounce function is disabled; others indicate the debounce time in ms.

6.2.4.4 Set Input Channel Interrupt Enable Status

- Description
  Set the interrupt trigger type of the selected input channel.
- Syntax
  setDiIntEnable (i32 ch, IntType* type)
- Argument
  - ch: Input channel number.
  - type:

- If type is equal to NONE (0), no interrupts will happen while input status changed.
- If type is equal to RISING (1), interrupts happen only when a rising edge is detected at input channel.
- If type is equal to FALLING (2), interrupts happen only when a falling edge is detected at input channel.
- If type is equal to BOTH (3), interrupts happen both on rising and falling edge.

6.2.4.5 Get Input Channel Interrupt Enable Status

♦ Description

Get the interrupt trigger type of the selected input channel.

♦ Syntax

getDiIntEnable (i32 ch, IntType* type)

♦ Argument

- ch: Input channel number.
- type: The memory address to put the interrupt trigger type of the selected input channel.

6.2.4.6 Set Output Channel Status

♦ Description

Set the status of the selected output channel.

♦ Syntax

setDoStatus (i32 ch, u32 status)

♦ Argument

- ch: Output channel number.
- status: The channel status. 0 indicates switch off; 1 indicates switch on.

6.2.4.7 Set Spare IO Direction

♦ Description

Set the direction of all spare I/O channel.

♦ Syntax

setGpioDir (u32 dir)

♦ Argument

- dir: 32 bit direction indicator. Every bit is related to one spare I/O channel, e.g., bit 0 indicated spare I/O channel 0, and so on. Set the related bit to 1 if programs output; set to 0 if programs input.

6.2.4.8 Get Spare IO Direction

♦ Description

Get the direction of all spare I/O channel.

- Syntax
  getGpioDir (u32* dir)
- Argument
  - dir: The memory address to put the direction indicator.

6.2.4.9 Set Spare IO Status

- Description
  Set the output status of the selected spare IO channel. Only the channel which direction bit is set to 1 takes effect.
- Syntax
  setGpioStatus (i32 ch, u32 status)
- Argument
  - ch: Spare I/O channel index. From GPIO0 to GPIO15.
  - status: 0 indicates output low; 1 indicated output high.

6.2.4.10 Get Spare IO Status

- Description
  Get the status of the spare IO channel.
- Syntax
  getGpioStatus (u32* status)
- Argument
  - status: The memory address to put the spare IO channel status. Every bit is related to one spare I/O channel, e.g., bit 0 indicated spare I/O channel 0, and so on. For input channel, 0 indicates input low; 1 indicates input high. For output channel, 0 indicates output low; 1 indicates output high.

6.2.4.11 Get Door Switch Status

- Description
  Get the status of the selected door switch.
- Syntax
  getDoorSw (i32 sw, u32* status)
- Argument
  - sw: Door switch number. ALL indicates getting all door switches. To specify a dedicated door switch, set value range from DOOR1 to DOOR7.
  - status: The memory address to put the channel status. 0 indicates output low; 1 indicates output high. If sw equals to ALL, bit0 (the lowest significant bit) of value means the status

6.2.4.12 Get Button Status

- Description

  Get the status of the selected button.

- Syntax

  getBut (i32 but, u32* status)

- Argument
  - but: Button number. ALL indicates getting all buttons. To specify a dedicated button, set value range from BUT1 to BUT16.
  - status: The memory address to put the channel status. 0 indicates output low; 1 indicates output high. If but equals to ALL, bit0 (the lowest significant bit) of value means the status of BUT1, bit1 means the status of BUT2, and so on.

6.2.4.13 Get Key Status

- Description

  Get the status of the selected key.

- Syntax

  getKey (i32 key, u32* status)

- Argument
  - key: Key number. ALL indicates getting all keys. To specify a dedicated key, set value range from KEY1 to KEY5.
  - status: The memory address to put the channel status. 0 indicates output low; 1 indicates output high. If key equals to ALL, bit0 (the lowest significant bit) of value means the status of KEY1, bit1 means the status of KEY2, and so on.

6.2.4.14 Get DIP Switch Status

- Description

  Get the status of the selected DIP switch.

- Syntax

  getDipSw (i32 dip, u32* status)

- Argument
  - dip: DIP switch number. ALL indicates getting all DIP switch. To specify a dedicated dip, set value range from DIP1 to DIP8.
  - status: The memory address to put the channel status. 0 indicates output low; 1 indicates output high. If dip equals to ALL, bit0 (the lowest significant bit) of value means the status of DIP1, bit1 means the status of DIP2, and so on.

6.2.4.15 Get Lamp Status

- Description

  Get the status of the selected lamp.

- Syntax

  getLamp (i32 lamp, u32* status)

- Argument
  - lamp: Lamp number. ALL indicates getting all lamps. To specify a dedicated lamp, set value range from LAMP1 to LAMP16.
  - status: The memory address to put the channel status. 0 indicates output low; 1 indicates output high. If lamp equals to ALL, bit0 (the lowest significant bit) of value means the status of LAMP1, bit1 means the status of LAMP2, and so on.

6.2.4.16 Set Lamp Status

- Description

  Set the status of the selected lamp.

- Syntax

  setLamp (i32 lamp, u32 status)

- Argument
  - lamp: Lamp number. ALL indicates getting all lamps. To specify a dedicated lamp, set value range from LAMP1 to LAMP16.
  - status: The channel status. 0 indicates output low; 1 indicates output high. If lamp equals to ALL, bit0 (the lowest significant bit) of value means the status of LAMP1, bit1 means the status of LAMP2, and so on.

6.2.4.17 Get Coin In A Input Status

- Description

  Get the status of CoinIn A

- Syntax

  getCoinInA (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates open circuit; 1 indicates closed circuit.

6.2.4.18 Get Coin In B Input Status

- Description

  Get the status of CoinIn B

- Syntax

getCoinInB (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates open circuit; 1 indicates closed circuit.

6.2.4.19 Get Bill In Input Status

- Description

  Get the status of BillIn

- Syntax

  getBillIn (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates open circuit; 1 indicates closed circuit.

6.2.4.20 Get Hopper Sensor Input Status

- Description

  Get the status of Hopper Sensor.

- Syntax

  getHopperSensor (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates open circuit; 1 indicates closed circuit.

6.2.4.21 Get Coin Enable Status

- Description

  Get the status of Coin Enable channel.

- Syntax

  getCoinEnable (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates switch off; 1 indicates switch on.

6.2.4.22 Set Coin Enable Status

- Description

  Set the status of Coin Enable channel.

- Syntax

  setCoinEnable (u32 status)

- Argument

- status: 0 indicates switch off; 1 indicates switch on.

6.2.4.23 Get Bill Enable Status

- Description

  Get the status of Bill Enable channel.

- Syntax

  getBillEnable (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates switch off; 1 indicates switch on.

6.2.4.24 Set Bill Enable Status

- Description

  Set the status of Bill Enable channel.

- Syntax

  setBillEnable (u32 status)

- Argument
  - status: 0 indicates switch off; 1 indicates switch on.

6.2.4.25 Get Hopper SSR Status

- Description

  Get the status of Hopper SSR channel.

- Syntax

  getHopperSsr (u32* status)

- Argument
  - status: The memory address to put the channel status. 0 indicates switch off; 1 indicates switch on.

6.2.4.26 Set Hopper SSR Status

- Description

  Set the status of Hopper SSR channel.

- Syntax

  setHopperSsr (u32 status)

- Argument
  - status: 0 indicates switch off; 1 indicates switch on.

6.2.4.27 Set Pulse Generator Enable Status

- Description

  Set the enable status of the selected pulse generator.

- Syntax
  enablePg (i32 pg, u32 enable)
- Argument
  - pg: Pulse generator number. Range from PG1 to PG8.
  - enable: The enable status of the selected pulse generator. 0 indicates the output channel works as a general-purpose output; 1 indicates the output channel works as a pulse generator.

6.2.4.28 Set Pulse Generator Parameters

- Description
  Set all parameters of the selected pulse generator and immediately start it.
- Syntax
  setPg (i32 pg, u8 base, u8 duration, u16 cycle)
- Argument
  - pg: Pulse generator number. Range from PG1 to PG8.
  - base: The pulse generator timebase of the selected output channel. 0 indicates the base is 1 ms; 1 indicates the base is 100 ms.
  - duration: The time of the related pulse generator remains high in one cycle. The pulse generator works as 50% duty cycle.
  - cycle: The number of the related pulse generator running cycle.

6.2.4.29 Get Pulse Generator Current Remaining Cycle

- Description
  Get the remaining cycle of the selected pulse generator.
- Syntax
  getPg (i32 pg, u16* cycle)
- Argument
  - pg: Pulse generator number. Range from PG1 to PG8.
  - cycle: The memory address to put the remaining cycle of the selected pulse generator.

6.2.4.30 Stop Pulse Generator

- Description
  Immediately stop the selected pulse generator.
- Syntax
  stopPg (i32 pg, u16* cycle)
- Argument

- pg: Pulse generator number. Range from PG1 to PG8.
- cycle: The memory address to put the remaining cycle of the selected pulse generator.

6.2.4.31 Set Counter Enable Status

- Description

  Set the enable status of the selected counter.

- Syntax

  enableCnt (i32 cnt, u32 enable)

- Argument
  - cnt: Counter index. Range from CNT1 to CNT4.
  - enable: The enable status of the selected counter. 0 indicates the input channel works as a general-purpose input; 1 indicates the input channel works as a counter.

6.2.4.32 Clear Counter Value

- Description

  Clear the selected pulse generator value to zero and feedback the current value.

- Syntax

  clearCnt (i32 cnt, u16* value)

- Argument
  - cnt: Counter index. Range from CNT1 to CNT4.
  - value: The memory address to put the current counter value of the selected counter.

6.2.4.33 Set Counter Parameters

- Description

  Set all parameters of the selected counter and immediately start it.

- Syntax

  setCnt (i32 cnt, u8 type, u8 timeout, u16 target)

- Argument
  - cnt: Counter index. Range from CNT1 to CNT4.
  - type: 0 indicates counter increases while rising edge is detected; 1 indicates counter increases while falling edge is detected.
  - timeout: The time interval that counter has to wait to trigger interrupt if the input states remains unchanged. The unit is 1ms. This interrupt is related to counter timeout event.
  - target: The counter will trigger an interrupt if it counts to target value. This interrupt is related to counter overflow event. Counter value will automatically return to 0 if it counts to target value.

6.2.4.34 Get Counter Current Value

- Description

  Get the current count value of the selected counter. The counter value remains unchanged after this action.

- Syntax

  getCnt (i32 cnt, u16* value)

- Argument
  - cnt: Counter index. Range from CNT1 to CNT4.
  - value: The memory address to put the current count value of the selected counter.

6.2.4.35 Setup Coin Hopper Action

- Description

  Specify the Counter4 parameters and set Hopper SSR to closed circuit. If the specify counter target is reached, Hopper SSR will immediately change to open circuit. The Hopper Sensor channel (Counter4) will set to counter mode automatically. A counter overflow event will also log in the event queue if all actions are finished.

- Syntax

  setCoinHopper(u8 type, u8 timeout, u16 target)

- Argument
  - type: 0 indicates counter increases while rising edge is detected; 1 indicates counter increases while falling edge is detected.
  - timeout: The time interval that counter has to wait to trigger interrupt if the input states remains unchanged. The unit is 1ms. This interrupt is related to counter timeout event. To be noted, even timeout event happened, Hopper SSR will not change status.
  - target: The counter will trigger an interrupt if it counts to target value. This interrupt is related to counter overflow event. Counter value will automatically return to 0 if it counts to target value.

6.2.5 Timer

6.2.5.1 Set Timer Parameters

- Description

  Set all parameters of the selected timer and immediately start it.

- Syntax

  setTimer (i32 timer, u8 mode, u8 base, u16 value)

- Argument
  - timer: The timer number. Range from TIMER1~TIMER4.

- mode: The running mode of the selected timer. 0 indicates simple timer. 1 indicates cycle timer. Cycle timer mode will immediately restart from setting value once it counts to zero.
- base: The time base of the selected timer. 0 indicates the base is 1 μs; 1 indicates the base is 1ms; 2 indicates the base is 1s.
- value: The countdown value of the selected timer.

6.2.5.2 Get Timer Current Remaining Count

- Description

  Get the remaining count of the selected timer.

- Syntax

  getTimer (i32 timer, u16* value)

- Argument
  - timer: Timer number. Range from TIMER1~TIMER4.
  - value: The memory address to put the remaining count of the selected timer.

6.2.5.3 Stop Timer

- Description

  Stop the selected timer.

- Syntax

  stopTimer (i32 timer)

- Argument
  - timer: Timer number. Range from TIMER1~TIMER4.

6.3 AGA2

6.3.1 General Usage

6.3.1.1 Get AGA2 Version Information

- Description

  This function is used to get the version information of AGA2.

- Syntax

  getInfo (AgaInfo* agaInfo)

- Argument
  - agaInfo: The memory address to put AgaInfo structure.

- AgaInfo structure
  - u8 model[8]: 8 bytes model information.
  - u8 majorVersion[2]: 2 byte major version of AGA2.

- u8 minorVersion: 1 byte minor version of AGA2.

6.3.1.2 Set AGA2 Password

- Description

  This function is used to set the password of AGA2. The default password is “00000000” in ASCII code.

- Syntax

  setPwd (u8* oldpwd, u8* newpwd)

- Argument
  - oldpwd: The memory address to put the old 8 bytes password.
  - newpwd: The memory address to put the new 8 bytes password.

6.3.2 Real Time Clock

6.3.2.1 Get Real Time Clock

- Description

  Get the real time clock.

- Syntax

  getRtc (struct tm* rtc)

- Argument
  - rtc: The memory address to put the tm structure.

6.3.2.2 Set Real Time Clock

- Description

  Set real time clock.

- Syntax

  setRtc (struct tm rtc, u8* pwd)

- Argument
  - rtc: The tm structure to put the assigned time.
  - pwd: The memory address to put the 8 bytes password.

6.3.3 Event Log

6.3.3.1 Get Intrusion Event Log

- Description

  Get all intrusion event logs and clear them at the same time.

- Syntax

  getIntrlog (Intrlog* intrlog, u8* pwd)

- Argument
  - intrlog: The memory address to put the Intrlog structure. There are eight intrusion events

i. The HIGH to LOW log of door switch 1.

ii. The LOW to HIGH log of door switch 1.

iii. The HIGH to LOW log of door switch 2.

iv. The LOW to HIGH log of door switch 2.

v. The HIGH to LOW log of door switch 3.

vi. The LOW to HIGH log of door switch 3.

vii. The HIGH to LOW log of door switch 4.

viii. The LOW to HIGH log of door switch 4.

ix. The HIGH to LOW log of door switch 5.

x. The LOW to HIGH log of door switch 5.

xi. The HIGH to LOW log of door switch 6.

xii. The LOW to HIGH log of door switch 6.

xiii. The HIGH to LOW log of door switch 7.

xiv. The LOW to HIGH log of door switch 7.

xv. The HIGH to LOW log of system reboot.

xvi. The LOW to HIGH log of system reboot.

- pwd: The memory address to put the 8 bytes password.

♦ Intrlog structure

- struct tm timestamp: The tm structure of the intrusion event log.
- u8 type: The intrusion event type. HI2LO indicates the status changed from high to low. LO2HI indicates the status changed from low to high.

6.3.3.2 Clear Intrusion Event Log

♦ Description

Clear all intrusion event logs.

♦ Syntax

clrIntrlog (u8* pwd)

♦ Argument

- pwd: The memory address to put the 8 bytes password.

6.3.3.3 Get Intrusion Event Enable Status

- Description

  Get all intrusion event enable status.

- Syntax

  getIntrlogEnable (u8* enable)

- Argument
  - enable: The memory address to put the intrusion event enable value. 0 indicates intrusion event log feature is disabled; 1 indicates intrusion event log feature is enabled. Bit0 (the lowest significant bit) of enable value indicates to door switch 1, bit1 indicates door switch 2, and so on.

6.3.3.4 Set Intrusion Event Enable Status

- Description

  Set all intrusion event enable status.

- Syntax

  setIntrlogEnable (u8 enable, u8* pwd)

- Argument
  - enable: The intrusion event enable value. 0 indicates to disable event log feature; 1 indicates to enable intrusion event log feature. Bit0 (the lowest significant bit) of enable value indicates to door switch 1, bit1 indicates door switch 2, and so on.
  - pwd: The memory address to put the 8 bytes password.

6.3.3.5 Get Battery Low Event Log

- Description

  Get the battery low event log.

- Syntax

  getBatlog (i32 id, strut tm* batlog)

- Argument
  - id: Battery index.
  - batlog: The memory address to put the tm structure of the battery low event.

6.3.3.6 Clear Battery Low Event Log

- Description

  Clear the battery low event log.

- Syntax

  clrBatlog (i32 id, u8* pwd)

- Argument
  - id: Battery index.
  - pwd: The memory address to put the 8 bytes password.

6.3.4 iButton

6.3.4.1 Reset iButton

- Description

  Reset the iButton.

- Syntax

  resetiBtn (i32 id)

- Argument
  - id: Battery index.

6.3.4.2 Get iButton Data

- Description

  Get one byte data from iButton.

- Syntax

  getiBtn (i32 id, u8* data)

- Argument
  - id: Battery index.
  - data: The memory address to put the iButton data.

6.3.4.3 Set iButton Data

- Description

  Set one byte data to iButton.

- Syntax

  setiBtn (i32 id, u8 data)

- Argument
  - id: Battery index.
  - data: The 1 byte data to set.

6.3.5 EEPROM

6.3.5.1 Get Data From EEPROM

- Description

  Get data from EEPROM.

- Syntax

  getEeprom (u16 offset, u8* data, u16 size)

- Argument
  - offset: The offset of EEPROM.
  - data: The memory address to put the data from EEPROM.
  - size: The retrieved data size from EEPROM.

6.3.5.2 Set Data to EEPROM

- Description

  Set data to EEPROM.

- Syntax

  setEeprom (u16 offset, u8* data, u16 size)

- Argument
  - offset: The offset of EEPROM.
  - data: The memory address to put the data writing to EEPROM.
  - size: The writing data size to EEPROM.

6.3.6 ProtectU 2.0

6.3.6.1 Set AES Key

- Description

  Set AES key which encrypt / decrypt secured information while communicating with AGA.

- Syntax

  setAesKey(u8* key)

- Argument
  - key: The memory address to put 16 bytes AES key.

6.3.6.2 Set ProtectU 2.0 Hash Value

- Description

  Set ProtectU 2.0 verified hash value.

- Syntax

  setHash(u8* hash)

- Argument
  - hash: The memory address to put 64 bytes hash value.

6.3.6.3 Set ProtectU 2.0 Hash Value By Assigned File

- Description

  Set ProtectU 2.0 verified hash value by assigned file content. The hash value is calculated by the assigned file on the fly. Due to the different file handle mechanism, under different operation system will require different argument. Please see the example bellowed.

- Syntax

  Windows: setHashByFile(HANDLE fd)

  Linux: setHashByFile(FILE* fp)

- Argument
  - fd: The file handle of the assigned file.
  - fp: The file structure pointer of the assigned file.
- Example

Windows:

```
u8 buffer[256];
HANDLE fd;
printf("Please input file name to calculate 512 bits hash value: ");
scanf("%s", buffer);
fd = CreateFile((char*)buffer, GENERIC_READ, 0, NULL, OPEN_EXISTING, NULL, NULL);
if(INVALID_HANDLE_VALUE == fd) {
    printf("Failed to open file!\n");
    return;
}
setHashByFile(fd);
```

Linux:

```
u8 buffer[256];
FILE* fp;
printf("Please input file name to calculate 512 bits hash value: ");
scanf("%s", buffer);
fp = fopen((char*)buffer, "r");
if(!fp) {
    printf("Failed to open file!\n");
    return;
}
setHashByFile(fp);
```

6.3.6.4 Get ProtectU 2.0 Operating Mode

- Description
  Get ProtectU 2.0 operating mode.
- Syntax
  getTrustMode(u8* mode)
- Argument
  - mode: The memory address to put operating mode value. 0 indicates Disable, 1 indicates Unlock Enable, 2 indicates Lock Enable.

6.3.6.5 Set ProtectU 2.0 Operating Mode

- Description
  Set ProtectU 2.0 operating mode.
- Syntax
  setTrustMode(u8 mode)
- Argument
  - mode: The operating mode value to set. 0 indicates Disable, 1 indicates Unlock Enable, 2 indicates Lock Enable.

6.3.6.6 Get ProtectU 2.0 Verification Time

- Description
  Get ProtectU 2.0 verification time. ProtectU2.0 will require a successful check within verification time. Otherwise, the system will hang within one minute.
- Syntax
  getTrustTime(u16* time)
- Argument
  - time: The memory address to put verification time value. The value is unit of seconds and at most 6000.

6.3.6.7 Set ProtectU 2.0 Verification Time

- Description
  Set ProtectU 2.0 verification time. ProtectU2.0 will require a successful check within verification time. Otherwise, the system will hang within one minute.
- Syntax
  setTrustTime(u16 time)
- Argument
  - time: The verification time to set. The value is unit of seconds and at most 6000.

6.3.6.8 Check ProtectU 2.0 Hash Value

- Description

Send hash value to check.

- Syntax

  checkTrust(u8* hash)

- Argument
  - hash: The memory address to put 64 bytes hash value.

6.3.6.9 Check ProtectU 2.0 Hash Value By Assigned File

- Description

  Send hash value to check. The hash value is calculated by an assigned file on the fly. Due to the different file handle mechanism, under different operation system will require different argument. Please see the example bellowed.

- Syntax

  Windows : checkTrustByFile(HANDLE fd)

  Linux : checkTrustByFile(FILE* fp)

- Argument
  - fd: The file handle of the assigned file.
  - fp: The file structure pointer of the assigned file.

- Example

Windows:

```
u8 buffer[256];
HANDLE fd;
printf("Please input file name to calculate 512 bits hash value: ");
scanf("%s", buffer);
fd = CreateFile((char*)buffer, GENERIC_READ, 0, NULL, OPEN_EXISTING, NULL, NULL);
if(INVALID_HANDLE_VALUE == fd) {
   printf("Failed to open file!\n");
   return;
}
checkTrustByFile (fd);
```

Linux:

```
u8 buffer[256];
FILE* fp;
```

```
printf("Please input file name to calculate 512 bits hash value: ");
scanf("%s", buffer);
fp = fopen((char*)buffer, "r");
if(!fp) {
   printf("Failed to open file!\n");
   return;
}
checkTrustByFile (fp);
```

6.4 Flash

6.4.1 Erase Flash

- Description

  Erase the entire flash. All byte value will change to 0xFF after this action.

- Syntax

  eraseFlash (void)

- Argument
  - None.

6.4.2 Write Flash

- Description

  Write data to flash. You can only write at most 256 bytes at one time using this function. You **have to** erase flash before you can successfully write any data to flash.

- Syntax

  setFlash (u32 offset, u8* data, u32 size)

- Argument
  - offset: The offset of flash.
  - data: The memory address to put the data writing to flash.
  - size: The writing data size to flash. Return failed if more than 256.

6.4.3 Read Flash

- Description

  Read data from flash.

- Syntax

  getFlash(u32 offset, u8* data, u32 size)

- Argument
  - offset: The offset of flash.
  - data: The memory address to put the data from flash.
  - size: The retrieved data size from flash.

6.5 Return Value

This chapter describes the return value of the API functions. The return value is formatted as the following table. If the function executes successfully, the return value is 0.

31 24	23 16	15 8	7 0
API Code	AGA Error Code	General Error Code	Reserved

6.5.1 API Code

- **0x01 : registerAgc**
- **0x02 : releaseAgc**
- **0x03 : setCallBack**
- **0x04 : getEventBuf**
- **0x05 : getEventCnt**
- **0x06 : clrEventBuff**
- **0x10 : getDiIntEnable**
- **0x11 : setDiIntEnable**
- **0x12 : getDiDebounce**
- **0x13 : setDiDebounce**
- **0x14 : getChStatus**
- **0x15 : setDoStatus**
- **0x16 : getDoorSw**
- **0x17 : getBut**
- **0x18 : getKey**
- **0x19 : getDipSw**
- **0x1A : getLamp**
- **0x1B : setLamp**
- **0x20 : getGpioDir**
- **0x21 : setGpioDir**
- **0x22 : getGpioStatus**
- **0x23 : setGpioStatus**
- **0x24 : getCoinInA**
- **0x25 : getCoinInB**
- **0x26 : getBillIn**
- **0x27 : getHopperSensor**
- **0x28 : getCoinEnable**

- **0x29 : setCoinEnable**
- **0x2A : getBillEnable**
- **0x2B : setBillEnable**
- **0x2C : getHopperSsr**
- **0x2D : getHopperSsr**
- **0x30 : enablePg**
- **0x31 : setPg**
- **0x32 : getPg**
- **0x33 : stopPg**
- **0x50 : setTimer**
- **0x51 : getTimer**
- **0x52 : stopTimer**
- **0x70 : getSramByte**
- **0x71 : getSramWord**
- **0x72 : getSramDword**
- **0x73 : getSramBlock**
- **0x74 : setSramByte**
- **0x75 : setSramWord**
- **0x76 : setSramDword**
- **0x77 : setSramBlock**
- **0x78 : setSramMode**
- **0x79 : getSramMode**
- **0x90 : enableCnt**
- **0x91 : clearCnt**
- **0x92** : **setCnt**
- **0x93** : **getCnt**
- **0x94** : **setCoinHopper**
- **0xA4 : getRtc**
- **0xA5 : setRtc**
- **0xA6 : getIntrlog**
- **0xA7 : clrIntrlog**
- **0xA8 : getIntrlogEnable**
- **0xA9 : setIntrlogEnable**
- **0xAA : getBatlog**
- **0xAB : clrBatlog**
- **0xAD : resetiBtn**
- **0xAE : getiBtn**
- **0xAF : setiBtn**

- **0xB0 : getInfo**
- **0xB1 : setPwd**
- **0xB2 : getEeprom**
- **0xB3 : setEeprom**
- **0xC1 : setHash**
- **0xC3 : setHashByFile**
- **0xC4 : getTrustMode**
- **0xC5 : setTrustMode**
- **0xC6 : getTrustTime**
- **0xC7 : setTrustTime**
- **0xC8 : checkTrust**
- **0xC9 : checkTrustByFile**
- **0xD0 : getFlash**
- **0xD1 : setFlash**
- **0xD2 : eraseFlash**

6.5.2 AGA Error Code

- **0xE0 : Handshake error**
- **0xE2 : Hash value does not match**
- **0xE7 : Check i2c slave address acknowledge fail**
- **0xE8 : Check i2c word address acknowledge fail**
- **0xE9 : Check i2c data byte acknowledge fail**
- **0xEA : iButton device not presence**
- **0xEB : Check password fail**
- **0xEC : Confirm password fail**
- **0xEE : Loops timeout fail**

6.5.3 General Error Code

- **0x01 : Serial port device fail (open/read/write)**
- **0x02 : AGA2 handshake fail**
- **0x04 : Incorrect input value**
- **0x05 : Open AGC2 device fail**
- **0x06 : Read/write AGC2 device fail**
- **0x07 : Create thread fail**
- **0x08 : Access I2C bus fail**
- **0xFF : Others unknown errors**

Appendix Test Tool Guide

Chapter 1 Introduction

ACE-B7400 is an All-in-One gaming control box based on AMD 780E platform. It is designed for slot machine and AWP machine which requires powerful 3D video performance. Besides powerful integrated graphic controller, ACE-B7400 integrates all gaming control features.

In order to ease the customer's operation on ACE-B7400, Acrosser provides device driver, application interface (API), and source code of demo application. The provided software is available on both Windows and Linux. The API can be classified into two subclasses: Acrosser Gaming Core V2 (AGC2) and Acrosser Gaming Agent V2 (AGA2). The purpose of this document is try to guide users to use the demo application.

Chapter 2 SRAM

This chapter describes about SRAM test tool.

2.1 Get SRAM mode

2.1.1 Test Purpose

To get SRAM operating mode.

2.1.2 Test Example

SRAM supports two operating mode.

To test independent mode, use 2.2 Set SRAM mode and set mode to 0. Then use 2.6 to set offset 0x20000 under 4MB setting or 0x10000 under 2MB setting, and set data as 0x55. After then, use 2.6 to set offset 0x0 and data as 0x0. Use 2.3 to get offset 0x0 and verify if its value is 0x0 and get offset 0x20000 under 4MB setting or 0x10000 under 2MB setting and verify if its value is 0x55. If so, SRAM is running in independent mode.

To test replication mode, use 2.2 Set SRAM mode and set mode to 1. Then use 2.6 to set offset 0x20000 under 4MB setting or 0x10000 under 2MB setting, and set data as 0x55. After then, use 2.6 to set offset 0x0 and data as 0x0. Use 2.3 to get offset 0x0 and verify if its value is 0x0 and get offset 0x20000 under 4MB setting or 0x10000 under 2MB setting and verify if its value is 0x0. If so, SRAM is running in replication mode.

2.1.3 Test Criteria

As stated at 2.1.2.

2.2 Set SRAM mode

2.2.1 Test Purpose

To set SRAM operation mode.

2.2.2 Test Example

Set mode = 0 as independent mode. Set mode = 1 as replication mode.

2.2.3 Test Criteria

Use 2.1 to get SRAM operation mode to verify if the same as setting mode.

2.3 Get SRAM data in byte style

2.3.1 Test Purpose

To read SRAM data with byte alignment

2.3.2 Test Example

Use 2.6 to set offset 0x0, data 0x0. And then use this function to get offset 0x0 data.

2.3.3 Test Criteria

If getting value is equal to 0, then test passed.

2.4 Get SRAM data in word style

2.4.1 Test Purpose

To read SRAM data with word alignment

2.4.2 Test Example

Use 2.7 to set offset 0x0, data 0x0. And then use this function to get offset 0x0 data.

2.4.3 Test Criteria

If getting value is equal to 0, then test passed.

2.5 Get SRAM data in double word style

2.5.1 Test Purpose

To read SRAM data with double word alignment

2.5.2 Test Example

Use 2.8 to set offset 0x0, data 0x0. And then use this function to get offset 0x0 data.

2.5.3 Test Criteria

If getting value is equal to 0, then test passed.

2.6 Set SRAM data in byte style

2.6.1 Test Purpose

To write SRAM data with byte alignment

2.6.2 Test Example

Refer to 2.3

2.6.3 Test Criteria

Refer to 2.3

2.7 Set SRAM data in word style

2.7.1 Test Purpose

To write SRAM data with word alignment

2.7.2 Test Example

Refer to 2.4

2.7.3 Test Criteria

Refer to 2.4

2.8 Set SRAM data in double word style

2.8.1 Test Purpose

To write SRAM data with double word alignment

2.8.2 Test Example

Refer to 2.5

2.8.3 Test Criteria

Refer to 2.5

2.9 Verify SRAM using block access method

2.9.1 Test Purpose

To verify SRAM access using block access API

2.9.2 Test Example

It will automatically write and read and then verify SRAM data from offset 0 to maximum size. It will run 1000 loops.

2.9.3 Test Criteria

A message such as “The 0 th loop passed!” indicates the first time test loop success. If any error occurs while testing, a error message such as “Error when verify SRAM data at offset” will appear and indicate failure in which offset.

Chapter 3 GPIO

3.1 Get channel status

3.1.1 Test Purpose

To get digital I/O channel status.

3.1.2 Test Example

Get channel 5 status using this function.

3.1.3 Test Criteria

If on board chassis switch is pushed, you should get “Channel 5 is on”, otherwise you should get “Channel 5 is off”. If so, the test is passed, otherwise, it is failed.

3.2 Get door switch status

3.2.1 Test Purpose

To get door switches status.

3.2.2 Test Example

Get door switch 6 status using this function.

3.2.3 Test Criteria

If on board chassis switch is pushed, you should get “Door 6 is on”, otherwise you should get “Door 6 is off”. If so, the test is passed, otherwise, it is failed.

3.3 Get all door switches status

3.3.1 Test Purpose

To get all door switches status

3.3.2 Test Example

Refer to 3.2

3.3.3 Test Criteria

Refer to 3.2

3.4 Get button status

3.4.1 Test Purpose

To get button status

3.4.2 Test Example

Connect DI7 with DO5. Use 3.24 to set channel 47 as on.

3.4.3 Test Criteria

Verify if button 0 is on. If so, the test is passed, otherwise it is failed.

3.5 Get all buttons status

3.5.1 Test Purpose

To get all buttons status

3.5.2 Test Example

Refer to 3.4

3.5.3 Test Criteria

Refer to 3.4

3.6 Get key status

3.6.1 Test Purpose

To get key status

3.6.2 Test Example

Connect DI 23 with DO25. Use 3.24 to set channel 67 as on.

3.6.3 Test Criteria

Verify if key 0 is on. If so, the test is passed, otherwise it is failed.

3.7 Get all keys status

3.7.1 Test Purpose

To get all keys status

3.7.2 Test Example

Refer to 3.6.2

3.7.3 Test Criteria

Refer to 3.6.3

3.8 Get DIP switch status

3.8.1 Test Purpose

To get DIP switch status

3.8.2 Test Example

Move on board DIP switch 1 to on.

3.8.3 Test Criteria

Verify if DIP switch 1 is on.

3.9 Get all DIP switches status

3.9.1 Test Purpose

To get all DIP switches status

3.9.2 Test Example

Refer to 3.8.2

3.9.3 Test Criteria

Refer to 3.8.3

3.10 Get input channel debounce time

3.10.1 Test Purpose

To get input channel debounce time

3.10.2 Test Example

Use 3.11 to set channel 0 debounce time as 10. And then use this function to verify if channel 0 debounce time is 10.

3.10.3 Test Criteria

If channel 0 debounce time is equal to 10, it is passed; otherwise, it is failed.

3.11 Set input channel debounce time

3.11.1 Test Purpose

To set input channel debounce time

3.11.2 Test Example

Refer to 3.10.2

3.11.3 Test Criteria

Refer to 3.10.3

3.12 Get input channel interrupt enable value

3.12.1 Test Purpose

To get input channel interrupt enable value

3.12.2 Test Example

Use 3.13 to set channel 0 and enable value as 0. And then use this function to verify if channel 0 enable value is disabled.

3.12.3 Test Criteria

If “The interrupt of input channel 0 is disabled.” is shown, the test is passed; otherwise, it is failed.

3.13 Set input channel interrupt enable value

3.13.1 Test Purpose

To set input channel interrupt enable value

3.13.2 Test Example

Refer to 3.12.2

3.13.3 Test Criteria

Refer to 3.12.3

3.14 Get Coin-In signal A status

3.14.1 Test Purpose

To get Coin-In signal A status

3.14.2 Test Example

Connect DI28 with DO20. Use 3.24 to set channel 62 as on.

3.14.3 Test Criteria

If “Coin-In signal A is on” is shown, the test is passed; otherwise, it is failed.

3.15 Get Coin-In signal B status

3.15.1 Test Purpose

To get Coin-In signal B status

3.15.2 Test Example

Connect DI29 with DO21. Use 3.24 to set channel 63 as on.

3.15.3 Test Criteria

If “Coin-In signal B is on” is shown, the test is passed; otherwise, it is failed.

3.16 Get Bill-In status

3.16.1 Test Purpose

To get Bill-In status

3.16.2 Test Example

Connect DI30 with DO22. Use 3.24 to set channel 64 as on.

3.16.3 Test Criteria

If “Bill-In is on” is shown, the test is passed; otherwise, it is failed.

3.17 Get Hopper Sensor status

3.17.1 Test Purpose

To get Hopper Sensor status

3.17.2 Test Example

Connect DI31 with DO23. Use 3.24 to set channel 65 as on.

3.17.3 Test Criteria

If “Hopper Sensor is on” is shown, the test is passed; otherwise, it is failed.

3.18 Get Coin Enable status

3.18.1 Test Purpose

To get coin enable status

3.18.2 Test Example

Connect DI22 with DO24. Use 3.19 to set coin enable as on. Use 3.1 to get channel 22 status.

3.18.3 Test Criteria

Use this function to get coin enable status. If “Coin Enable is on” is shown, the test is passed; otherwise, it is failed.

3.19 Set Coin Enable status

3.19.1 Test Purpose

To set coin enable status

3.19.2 Test Example

Refer to 3.18

3.19.3 Test Criteria

If channel 22 is on, the test is passed; otherwise, it is failed.

3.20 Get Bill Enable status

3.20.1 Test Purpose

To get bill enable status

3.20.2 Test Example

Connect DI23 with DO25. Use 3.21 to set bill enable as on. Use 3.1 to get channel 23 status.

3.20.3 Test Criteria

Use this function to get bill enable status. If “Bill Enable is on” is shown, the test is passed; otherwise, it is failed.

3.21 Set Bill Enable status

3.21.1 Test Purpose

To set bill enable status

3.21.2 Test Example

Refer to 3.20

3.21.3 Test Criteria

If channel 23 is on, the test is passed; otherwise, it is failed.

3.22 Get Hopper SSR status

3.22.1 Test Purpose

To get hopper ssr status

3.22.2 Test Example

Connect DI24 with DO26. Use 3.23 to set hopper ssr as on. Use 3.1 to get channel 24 status.

3.22.3 Test Criteria

Use this function to get hopper ssr status. If “Hopper SSR is on” is shown, the test is passed; otherwise, it is failed.

3.23 Set Hopper SSR status

3.23.1 Test Purpose

To set hopper ssr status

3.23.2 Test Example

Refer to 3.22

3.23.3 Test Criteria

If channel 24 is on, the test is passed; otherwise, it is failed**.**

3.24 Set output channel status

3.24.1 Test Purpose

To set output channel status

3.24.2 Test Example

Connect DI0 with DO0. Use this function to set channel 42 as on. Use 3.1 to get channel 0 status.

3.24.3 Test Criteria

If channel 0 is on, the test is passed; otherwise, it is failed.

3.25 Get lamp status

3.25.1 Test Purpose

To get lamp status

3.25.2 Test Example

Connect DI0 with DI0. Use 3.26 to set lamp 1 as on. Use 3.1 to get channel

0 status.

3.25.3 Test Criteria

If “Lamp 1 is on” is shown, the test is passed; otherwise, it is failed.

3.26 Get all lamps status

3.26.1 Test Purpose

To get all lamps status

3.26.2 Test Example

Refer to 3.25.2

3.26.3 Test Criteria

Refer to 3.25.3

3.27 Set lamp status

3.27.1 Test Purpose

To get lamp status

3.27.2 Test Example

Refer to 3.25.2

3.27.3 Test Criteria

If channel 0 is on, the test is passed; otherwise, it is failed.

3.28 Set all lamps status

3.28.1 Test Purpose

To get all lamps status

3.28.2 Test Example

Refer to 3.25.2

3.28.3 Test Criteria

Refer to 3.27.3

3.29 Get GPIO port direction

3.29.1 Test Purpose

To get GPIO port direction

3.29.2 Test Example

Use 3.30 to set GPIO direction as 0xFF00. Use this function to get GPIO port direction.

3.29.3 Test Criteria

If “GPIO port direction is 0xFF00” is shown, the test is passed; otherwise, it is failed.

3.30 Set GPIO port direction

3.30.1 Test Purpose

To set GPIO port direction

3.30.2 Test Example

Refer to 3.29.2

3.30.3 Test Criteria

Refer to 3.29.3

3.31 Get GPIO port status

3.31.1 Test Purpose

To get GPIO port status

3.31.2 Test Example

Use 3.30 to set GPIO direction as 0xFFFF. Use 3.32 to set all GPIO status as 0. Use this function to get GPIO port status.

3.31.3 Test Criteria

If “GPIO port status is 0x0000” is shown, the test is passed; otherwise, it is failed.

3.32 Set GPIO port status

3.32.1 Test Purpose

To set GPIO port status

3.32.2 Test Example

Refer to 3.31.2

3.32.3 Test Criteria

Refer to 3.31.3

3.33 Enable counter

3.33.1 Test Purpose

To set GPI channel to function as a counter

3.33.2 Test Example

None

3.33.3 Test Criteria

None

3.34 Clear counter

3.34.1 Test Purpose

To clear counter value

3.34.2 Test Example

Connect DI28 with DO16. Set counter 1 parameters as trigger type to 0, timeout value to 0, counter target to 100. Use 3.39 to generate 99 pulses with 1ms high duty duration. Use this function to clear counter 1 value.

3.34.3 Test Criteria

If “Counter1 value is 99 and cleared to 0.” is shown, the test is passed; otherwise, it is failed.

3.35 Set counter parameters

3.35.1 Test Purpose

To set counter parameters

3.35.2 Test Example

Connect DI28 with DO16. Set counter 1 parameters as trigger type to 0, timeout value to 0, counter target to 100. Use 3.39 to generate 100 pulses with 1ms high duty duration.

3.35.3 Test Criteria

If “Get counter reach target event: CNT1 value 0.” is shown, the test is passed; otherwise, it is failed.

3.36 Get counter value

3.36.1 Test Purpose

To get counter value

3.36.2 Test Example

Connect DI28 with DO16. Set counter 1 parameters as trigger type to 0, timeout value to 0, counter target to 100. Use 3.39 to generate 99 pulses with 1ms high duty duration from PG1. Use this function to get counter value.

3.36.3 Test Criteria

If counter value is equal to 99, the test is passed; otherwise, it is failed.

3.37 Set Coin Hopper Output

3.37.1 Test Purpose

To set coin hopper output. Specify the counter4 parameters and set hopper ssr to closed circuit. If the specify counter target is reached, hopper ssr will immediately change to open circuit. The hopper sensor channel (counter4) will set to counter mode automatically. A counter overflow event will also log in the event queue if all actions are finished.

3.37.2 Test Example

Connect DI31 with DO19. Set counter4 parameter as trigger type to 0, timeout value to 0, counter target to 100. Use 3.22 to get hopper ssr status. It should be on now. And then Use 3.39 to generate 100 pulses with 1ms high duty duration from PG1. After PG1 is finished, use 3.22 to get hopper ssr status. It should be off now. If so, the test is passed; otherwise, it is failed.

3.37.3 Test Criteria

Refer to 3.37.2

3.38 Enable pulse generator

3.38.1 Test Purpose

To enable pulse generator

3.38.2 Test Example

None

3.38.3 Test Criteria

None

3.39 Set and start pulse generator

3.39.1 Test Purpose

To set and start a pulse generator

3.39.2 Test Example

Refer to 3.35.2

3.39.3 Test Criteria

Refer to 3.35.3

3.40 Stop pulse generator

3.40.1 Test Purpose

To stop pulse generator

3.40.2 Test Example

Use 3.39 to generate 100 pulses with 100ms high duty duration from PG1. Before PG1 is finished, use this function to stop PG1.

3.40.3 Test Criteria

If “Pulse generator 1 remains xx cycles.” (xx can be any integer smaller than 100) is shown, the test is passed; otherwise, it is failed.

3.41 Get pulse generator value

3.41.1 Test Purpose

To get pulse generator value

3.41.2 Test Example

Use 3.39 to generate 100 pulses with 100ms high duty duration from PG1. Before PG1 is finished, use this function to get PG1 value.

3.41.3 Test Criteria

If “Pulse generator 1 remains xx cycles.” (xx can be any integer smaller than 100) is shown, the test is passed; otherwise, it is failed.

Chapter 4 Timer

4.1 Set and start timer

4.1.1 Test Purpose

To set and start a timer

4.1.2 Test Example

Use this function to set timer 1 parameters as mode to 0, timebase to 2, and range to 0x05.

4.1.3 Test Criteria

After 5 seconds, if “Get timer finish event: Timer1.” is shown, the test is passed; otherwise, it is failed.

4.2 Stop timer

4.2.1 Test Purpose

To stop a timer

4.2.2 Test Example

Use 4.1 to set timer 1 parameters as mode to 0, timebase to 2, and range to 0x10. Use this function to stop timer 1 before it timeouts.

4.2.3 Test Criteria

If nothing happened after 16 seconds, the test is passed; otherwise, it is failed.

4.3 Get timer value

4.3.1 Test Purpose

To get a timer value

4.3.2 Test Example

Use 4.1 to set timer 1 parameters as mode to 0, timebase to 2, and range to 0x10. Use this function to get timer 1 value.

4.3.3 Test Criteria

If “Timer 1 remains xx cycles.” is shown, the test is passed; otherwise, it is failed.

Chapter 5 Flash

5.1 Get flash value

5.1.1 Test Purpose

To get flash value by byte

5.1.2 Test Example

Use flash_tool utility to write file to flash ram. Use this function to get offset 0 data.

5.1.3 Test Criteria

If getting data is equal to the first byte of written file, the test is passed; otherwise, it is failed.

5.2 Flash r/w test

5.2.1 Test Purpose

To test flash r/w automatically

5.2.2 Test Example

This function will automatically generate data to write to flash and then verify it one by one.

5.2.3 Test Criteria

If “R/W test passed!” is shown, the test is passed; otherwise, it is failed.

Chapter 6 AGA

To be noted, you have to set the correct AES key to successfully communicate with AGA.

6.1 Get RTC

6.1.1 Test Purpose

To get secondary RTC value

6.1.2 Test Example

Use 6.2 to set system time. The default password is “00000000”.

6.1.3 Test Criteria

Use this function to get secondary RTC value, if it is equal to system time, the test is passed; otherwise, it is failed.

6.2 Set RTC by system time

6.2.1 Test Purpose

To set secondary RTC value by system time

6.2.2 Test Example

Refer to 6.1.2

6.2.3 Test Criteria

Refer to 6.1.3

6.3 Set RTC by user setting

6.3.1 Test Purpose

To set secondary RTC value by user setting

6.3.2 Test Example

Set secondary RTC value to 2011/1/1 0:0:0, and week day is 1. And then use 6.1 to verify it.

6.3.3 Test Criteria

If getting value is near with the setting value, the test is passed; otherwise, it is failed.

6.4 Get AGA version information

6.4.1 Test Purpose

To get AGA version information

6.4.2 Test Example

None

6.4.3 Test Criteria

If “AGA version = v0.5” and “AGA model = 7400” are shown, the test is passed; otherwise, it is failed.

6.5 Get Intrusion logs

6.5.1 Test Purpose

To get intrusion event logs

6.5.2 Test Example

The default password is “00000000”

6.5.3 Test Criteria

If a list of event logs is shown, the test is passed; otherwise, it is failed.

6.6 Clear Intrusion logs

6.6.1 Test Purpose

To clear intrusion logs

6.6.2 Test Example

The default password is “00000000”

6.6.3 Test Criteria

If “Return 00000000” is shown, the test is passed; otherwise, it is failed.

6.7 Set Intrusion log mask

6.7.1 Test Purpose

To set intrusion log mask

6.7.2 Test Example

The default password is “00000000”. Use this function to set intrusion log mask to 0xFF. Use 6.8 to get intrusion log mask setting.

6.7.3 Test Criteria

If getting value is equal to 0xFF, the test is passed; otherwise, it is failed.

6.8 Get Intrusion log mask

6.8.1 Test Purpose

To get intrusion log mask

6.8.2 Test Example

Refer to 6.7.2

6.8.3 Test Criteria

Refer to 6.7.3

6.9 Get battery low log

6.9.1 Test Purpose

To get battery low log

6.9.2 Test Example

The default password is “00000000”

6.9.3 Test Criteria

If a battery log is shown, the test is passed; otherwise, it is failed.

6.10 Clear battery low log

6.10.1 Test Purpose

To clear battery low log

6.10.2 Test Example

The default password is “00000000”

6.10.3 Test Criteria

If “Return 00000000” is shown, the test is passed; otherwise, it is failed.

6.11 Get iButton ROM information

6.11.1 Test Purpose

To get iButton ROM information

6.11.2 Test Example

Use this function to get iButton1 (on board) information.

6.11.3 Test Criteria

If a list of iButton information is shown, the test is passed; otherwise, it is failed.

6.12 Set AGA password

6.12.1 Test Purpose

To set AGA password

6.12.2 Test Example

Input old password as default password “00000000” and set new password as “12345678”. Use new password to run 6.3.

6.12.3 Test Criteria

If RTC is changed, the test is passed; otherwise, the test is failed.

6.13 Read EEPROM

6.13.1 Test Purpose

To read a byte from EEPROM

6.13.2 Test Example

Use 6.14 to write EEPROM offset 0, value 0. And then use this function to get EEPROM offset 0 value.

6.13.3 Test Criteria

If getting value is equal to 0, the test is passed; otherwise, it is failed.

6.14 Write EEPROM

6.14.1 Test Purpose

To write a byte to EEPROM

6.14.2 Test Example

Refer to 6.13.2

6.14.3 Test Criteria

Refer to 6.13.3

6.15 Auto test EEPROM

6.15.1 Test Purpose

To test EEPROM r/w automatically.

6.15.2 Test Example

None.

6.15.3 Test Criteria

If “Verify data…… passed!!” is shown, the test is passed; otherwise, it is failed.

Chapter 7 Security

7.1 Set AES key

7.1.1 Test Purpose

To set AES key

7.1.2 Test Example

Set AES key as FFEEDDCCBBAA99887766554433221100

7.1.3 Test Criteria

If “Setup AES key to FFEEDDCCBBAA99887766554433221100” is shown, the test is passed; otherwise, it is failed.

7.2 Set hash value by file

7.2.1 Test Purpose

To set hash value by assigned file

7.2.2 Test Example

Assign an existing file name.

7.2.3 Test Criteria

If “Set Hash value by file success!” is shown, the test is passed; otherwise, it is failed.

7.3 Set hash value

7.3.1 Test Purpose

To set hash value

7.3.2 Test Example

Set hash value as FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100

7.3.3 Test Criteria

If “Set hash value to FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100” is shown, the test is passed; otherwise it is failed.

7.4 Get trust mode

7.4.1 Test Purpose

To get trust mode

7.4.2 Test Example

Use 7.5 to set trust mode as 0. And then use this function to get trust mode.

7.4.3 Test Criteria

If “Trust mode is disabled!” is shown, the test is passed; otherwise, it is failed.

7.5 Set trust mode

7.5.1 Test Purpose

To set trust mode

7.5.2 Test Example

Refer to 7.4.2

7.5.3 Test Criteria

Refer to 7.4.3

7.6 Get trust time

7.6.1 Test Purpose

To get trust time

7.6.2 Test Example

Use 7.5 to set mode to 0. Use 7.7 to set trust time to 1000. And use this function to get trust time.

7.6.3 Test Criteria

If getting value is equal to 1000, the test is passed; otherwise, it is failed.

7.7 Set trust time

7.7.1 Test Purpose

To set trust time

7.7.2 Test Example

Refer to 7.6.2

7.7.3 Test Criteria

Refer to 7.6.3

7.8 Check trust by file

7.8.1 Test Purpose

To generate a 64 byte hash value by an assigned file on the fly and then check it with AGA.

7.8.2 Test Example

Use 7.2 to set hash value by an existing file. Use this function to check value by the same file.

7.8.3 Test Criteria

If “Return 00000000” is shown, the test is passed; otherwise, it is failed.

7.9 Check trust by hash value

7.9.1 Test Purpose

To check hash value with AGA

7.9.2 Test Example

Use 7.3 to set hash value to FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100 FFEEDDCCBBAA99887766554433221100. And the use this function to check value by the same hash value.

7.9.3 Test Criteria

If “Return 00000000” is shown, the test is passed; otherwise, it is failed.